THE IRON AGE

A Review of the Hardware, Iron, Machinery and M[illegible]les.

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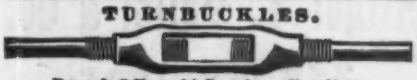

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Ad on Page 30

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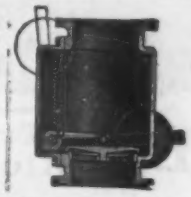

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THE IRON AGE

New York, Thursday, August 3, 1905.

The Union Pacific Gasoline Railroad Motor Car.

Last spring an experimental gasoline engine driven railroad car for light branch and interurban service was completed at the Omaha shops of the Union Pacific Railroad Company. Motor Car No. 1, as it is called, is a single truck, four-wheel car, seating 25 persons, and in actual operation has demonstrated the practicability of gasoline motor drive for the purpose. The car body is 31 feet long, and is mounted on wheels 42 inches in diameter. The total weight of the car is a trifle over 20 tons.

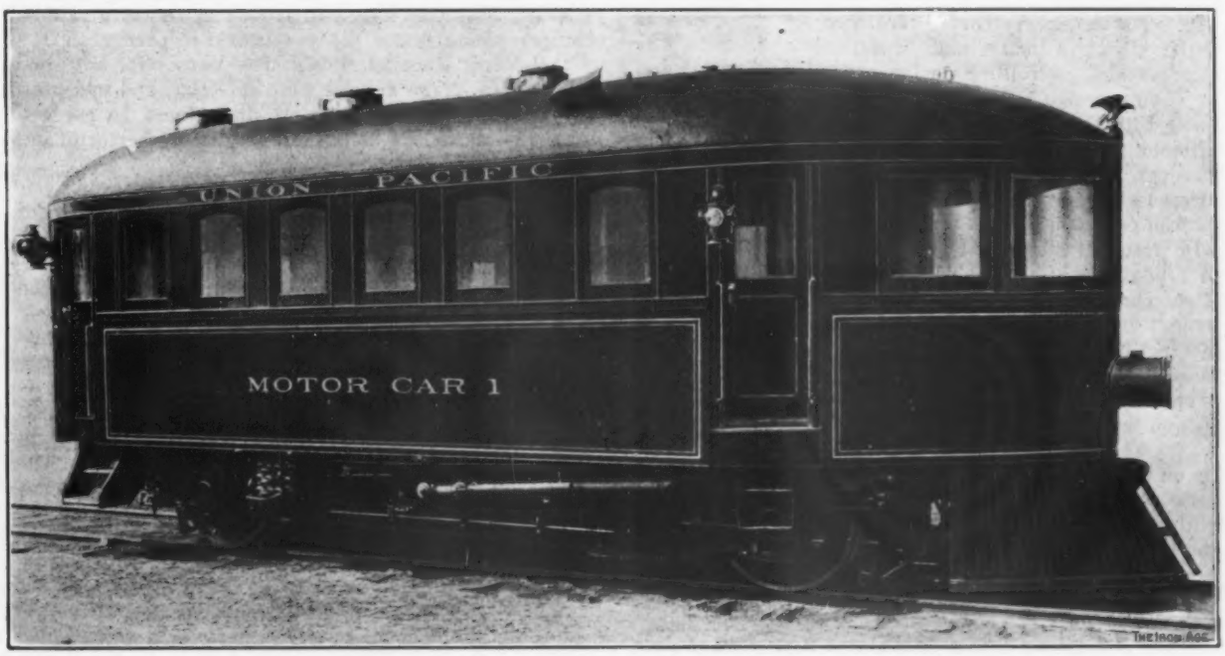


Fig. 1.—The Union Pacific Motor Car No. 1.

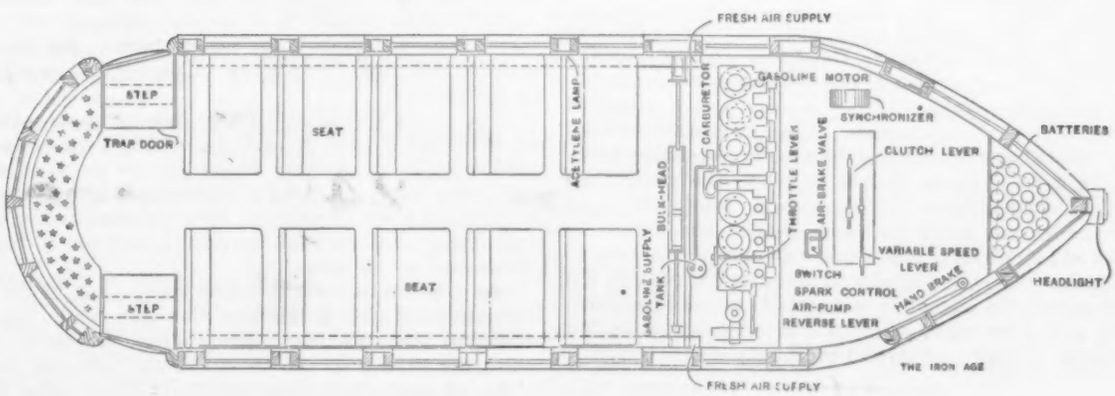


Fig. 2.—Plan Showing Interior Arrangement.

The lines of the car, as may be seen by Fig. 1, resemble those of an inverted boat. The front end is tapered to a sharp point and the roof is rounded off from the top, presenting no flat surface to air resistance, and the rear is rounded to avoid the vacuum produced by square end cars. The wind resistance is thus reduced to a minimum.

Ventilators of the old style sash and upper deck type have been omitted, adequate ventilation being secured through roof ventilators. These exhaust the air by suction from inside the car, and fresh air is taken in from the front through the car roof. A complete change of air can be obtained every four minutes if desired. The stuffy and close atmospheric condition so often encountered in electric and other cars is entirely avoided. The floor of the car is water tight, and can be easily and thoroughly flushed with hot water to destroy germs and remove dirt.

The water from the cylinder jackets of the engine is cooled in radiators around the sides of the car to give heat to the interior of the car in cold weather. In warm weather this water is piped to coils beneath the car. These two systems of coils afford means for regulating the temperature inside the car. If the car is too warm the water circulates below; if too cold the majority of the water circulates through the interior coil.

Acetylene gas is used for illuminating and in a powerful headlight. The lamps inside the car are provided with opalescent panels, producing a soft and at the same time powerful light.

The car is equipped with air brakes acting on all four wheels. Attached to the crank shaft of the engine is an air pump which maintains a pressure of 100 pounds in two reservoirs of 13 cubic feet capacity each. Numerous tests at a speed of 20 miles per hour have shown that the car can be stopped in 112 to 115 feet, without inconvenience to passengers. The car is also equipped with a

rachet lever hand brake. The car is built very strong, and in the event of a collision or wreck would almost surely preclude the possibility of telescoping.

The motive power is furnished by a six-cylinder vertical gasoline engine of 100 horse-power placed with its shaft at right angles to the center line of the car, as shown in the plan, Fig. 2. The cylinders are 8 x 10 inches, and are connected up in two opposed sets of three cylinders each, so that three power giving impulses are obtained at each revolution of the crank shaft. The engine is started by air taken from the air brake system, and has a wide range of control, affording great economy under variation of load. A synchronizer facilitates and simplifies the changing of speeds.

The reverse throttle and spark levers are conveniently located in easy reach of the operator. Immediately in front of the operator is the air brake valve lever and the emergency spark cutout, which enables him to stop the engine and apply full brake power in less than half a second. The spark current is furnished by eight cells of battery with a make and break spark device. The clutches and controlling devices are all mechanical and of simple design. Special effort has been made to do away with the complicated machinery ordinarily used in utilizing gasoline power for propelling a car of this kind. Through a special chain the engine crank shaft drives direct to the driving axle.

The car is intended for service on 4 per cent. grades with frequent stops, and is therefore at present geared to a maximum speed of about 35 miles per hour, but with slight changes it could be easily speeded to 60 miles per hour. The acceleration of the car from a standstill to 300 feet is superior to that of an electric car of the same horse-power, being much slower for the first 50 feet, avoiding an uncomfortable jerk in starting, but from 100 feet on the acceleration is very rapid.

On a level or a ½ per cent. grade the car starts readily on the high speed, direct connected, without the use of gears; although on anything over ½ per cent. grade or with a heavy trailer it is necessary to use the gear speeds. The car is easily controlled by one operator, and can be stopped and backed at will, although it is intended to run only in one direction.

The vibration and noise of the engine have been almost entirely elminated; in fact, it is stated that when the car is in motion neither can be noticed. The noise of the exhaust of the engine is destroyed in the muffler, and the burnt gases escape at the rear of the car without being an inconvenience.

Before being tested in actual road service the car was tried out around the Omaha shops and vicinity. During these tests it was coupled to two passenger cars—a standard mail car weighing 52,100 pounds and a standard coach weighing 60,000 pounds. These cars were successfully started and accelerated, both on a descending grade and on a 1-3 per cent. ascending grade, the motor thus starting a total load of 152,100 pounds. Pulling the mail car a trip was made to South Omaha and return in which a 1.6 per cent. grade was ascended at the rate of 11 miles per hour, the total load being 94,000 pounds. In another test the motor car successfully ascended a sharp grade of 7.8 per cent., or about 400 feet to the mile, the car being stopped and started repeatedly on the grade.

The Mexican Light & Power Company has placed a contract for copper cable, which is claimed to be the largest ever awarded. The contract calls for no less than 1500 miles of cable, equal in carrying capacity to 3/0 Brown & Sharpe gauge and weighing nearly 2000 tons. The cable is to be utilized on the power transmission line now under construction by the company between its power plant at Necaxa, which is to have an initial capacity of 45,000 horse-power and an ultimate development to 80,000 horse-power, and the City of Mexico, and from there to the El Oro mining district. It will be supported on steel towers with spans of 500 feet. Then length of the spans, together with the necessity for reducing the dip as much as possible, and the high wind pressure to be withstood, make the matter of these cables one of considerable importance.

The Scrap Iron and Steel Duty.

WASHINGTON, D. C., August 1, 1905.—The courts have finally adjudicated a question of great importance to manufacturers of iron and steel and other metals which has been pending in various forms for a number of years. The issue is as to the dutiable classification of manufactures of metals, which, though purchased, imported and used as scrap, have not been sufficiently broken up to lose their original identity. The court holds that where identity has not been lost the importations must pay duty as if the articles were new and not brought in as scrap.

In the case that has just been ruled upon, the Illinois Central Railroad Company imported a quantity of steel rails which were so defective as to be worthless except for scrap. Each rail was cut in two pieces before importation, the sections ranging from 12 to 16 feet in length. When offered for entry at the port of New Orleans they were classified by the local appraiser as T-rails and duty was assessed thereon at the rate of 7-20 cent per pound under the provisions of paragraph 130 of the act of July 24, 1897. The importers, however, claimed that as the articles were defective, and had been cut in two, they were properly dutiable at $4 per ton under the provisions of paragraph 122 of the tariff act, which provides as follows:

"Cast scrap iron and scrap steel, $4 per ton; but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured."

In ruling upon this case, the board stated that the rails were new but by reason of certain defects their value as a commercial rail had been depreciated; however, the articles were still rails and had not lost their character or identity as such. While it might be true, as alleged by the importers, that these rails were intended to be used by them as scrap iron, it was not satisfactorily shown that they were "fit only" for such use. The board then proceeded to cite a case which arose several years ago at Port Huron, Mich., involving the proper classification of certain locomotive tires upon which duty was assessed at 1½ cents per pound, but which were claimed to be eligible to entry as scrap steel at $4 per ton. The tires were accompanied by the affidavit of the master mechanic of the car shops in Canada from which they were shipped, which described them in detail and deposed that they were scrap. In that case, however, the board stated that "no fact is shown to prove that they have lost their identity as tires and that they have actually been broken up or become scrap or that they were waste and fit only for remanufacture, and the declaration that they are scrap is merely the conclusion of the affiant."

The board also cited another case of an importation of old brass cannon from Cuba, which were useless as artillery and of no value except for the metal of which they were made, but being manufactured articles and not having lost their identity by being broken up, the board held them to be dutiable as cannon and not entitled to free entry as old brass.

In view of the two decisions quoted and of the fact that the steel rails in the case were only cut in two, and therefore had not lost their identity, the board overruled the protest of the importers and affirmed the decision of the collector, under which duties were levied at $7.84 per gross ton as steel rails, instead of $4 as scrap iron or steel. The importers thereupon appealed the case to the United States Circuit Court for the Eastern District of Louisiana. This court, however, has handed down a decision sustaining the board on all points.

The Treasury Department has been advised that the importers have acquiesced in the decision of the Circuit Court, which will be promulgated for the guidance of customs officials at all ports. It is therefore suggested that importers of scrap iron or steel should ascertain before entering it that it is so broken up as not to be liable to duty in the form in which it was originally manufactured. In the case of the rails in question, it is believed that if they had been sheared into short lengths they would have been readily admitted as scrap, at a saving of $3.84 per ton in duties.

W. L. C.

Exports to Mexico.

DURANGO, July 19, 1905.—Although the official figures covering the imports of merchandise into this country for the fiscal year 1904-1905 are not yet available, the statistics for nine months—July 1, 1904, to March 31, 1905—are at hand, and are of a satisfactory character, in so far as they give proof that the steady increase in the country's prosperity continues, and that its importance as a market can scarcely be overestimated by the manufacturers and exporters of the United States.

The aggregate value of the imports from all countries during the nine months indicated was $63,119,877.69, gold, being an increase of $5,610,709.41 over the total for the corresponding period in the fiscal year 1903-1904.

The various classes of merchandise included in this total and their value is shown in the following table:

Animal substances	$5,156,866.17
Vegetable substances	11,012,081.06
Mineral substances	18,580,981.51
Dry goods	8,306,283.78
Chemicals, drugs	2,365,750.19
Beverages	2,440,914.04
Paper and applications	1,937,231.53
Machinery and apparatus	7,992,705.88
Vehicles	1,428,927.78
Arms, explosives	2,056,346.43
Miscellaneous	1,841,789.32
Total in nine months, 1904-05	$63,119,877.69

Of this total manufacturers of the United States supplied products to the value of $35,159,205, or more than 50 per cent. of the whole, compared with $31,366,739 in the nine months of the preceding fiscal year. Of the countries which supplied the balance, the following were the chief:

	1904-05.	1903-04.
Great Britain	$7,696,790	$7,434,157
Germany	7,412,295	7,142,215
France	6,296,787	5,241,272
Spain	2,785,549	2,321,380
Belgium	1,049,779	1,756,450

From these figures it would appear at first sight that the United States, supplying as it did considerably more than one-half of the country's total imports, completely dominates the situation, and beyond the fear of its trade being cut into by any foreign competitor in this market. This, however, is a false assumption, for while the United States possesses all the advantages which accrue from its geographical situation as a close neighboring country, the imports from at least one other country—France—far exceed in their proportional increase the increase in the total of United States imports. To illustrate this important point, and as an object lesson to exporters north of the Rio Grande, attention is invited to the following exhibit, which shows the increases in gold values of the imports from the United States and from European countries during the nine months specified above:

United States	$3,792,465
Great Britain	262,632
Germany	270,079
France	1,055,514
Spain	464,109

Examination of the table, wherein the imports are roughly classified, will reveal the fact that the fourth largest item is that of machinery and apparatus, which reached the respectable total value of $7,992,705.88. This sum might be augmented by the addition of the value of imported vehicles ($1,428,927.78) and furthermore by that of arms and ammunition ($2,056,346.48), making a grand total of $11,477,980.14 as the aggregate value of the classes of manufactures in which readers of *The Iron Age* are more especially interested. Of this total there is little doubt that the United States supplies by far the largest quota. Without definite information as to what were the products which the Mexican people bought from France, to the visible swelling of that country's exports to this market, and the somewhat remarkable proportionate increase in its total as compared with that of the United States, one may conjecture that they belonged to the special lines of characteristic French manufactures and productions to which the Latin taste inclines. They no doubt included dry goods, wines and liquors, silks, tapestries, comestibles, jewelry, diamonds, &c. In these and other lines in which the French lead imports from France will very likely continue to increase. There is a growing middle class in Mexico whose tastes are European rather than American and, other things being equal, its members would purchase an article of French origin in preference to a similar article made in the United States, for purely sympathetic reasons. To offset this competitive factor manufacturers in the United States should diligently push those products in which their supremacy is recognized—which, of course, means those having iron and steel as a basis. J. J. D.

June Iron and Steel Exports and Imports.

The report of the Bureau of Statistics of the Department of Commerce and Labor for the month of June shows a slight decrease in exports of iron and steel as compared with May. Taking the commodities for which quantities are given, these exports give a footing of 71,490 gross tons, as compared with 74,073 tons in May. The figures for the 12 months completing the fiscal year 1905 are also given, and they show a very heavy gain on the preceding year. These details are presented in the following table:

Exports of Iron and Steel.

	June,		Twelve months.	
	1905.	1904.	1905.	1904.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	1,390	2,659	46,971	34,635
Scrap	716	2,206	19,710	16,845
Bar iron	1,776	2,544	32,323	22,669
Wire rods	864	2,362	15,738	15,781
Steel bars	932	3,702	24,164	21,446
Billets, ingots, blooms	9,703	32,068	236,155	176,961
Hoop, band, scroll	278	270	3,029	2,839
Iron rails	....	196	78	1,513
Steel rails	22,340	51,101	409,429	160,894
Iron sheets and plates	926	722	5,557	5,931
Steel sheets and plates	8.888	1,985	71,000	19,151
Tin plates and terne plates	816	539	10,265	3,619
Structural iron and steel	4,997	5,866	73,287	35,884
Wire	12,508	9,457	126,178	113,856
Cut Nails	1,583	950	9,101	9,575
Wire nails	3,540	2,346	36,856	32,431
All other, including tacks	233	267	3,739	2,560
Totals	71,490	119,240	1,123,580	676,590

The imports of iron and steel showed a slight increase in June. Taking the commodities for which quantities are given, the total for June was 40,385 gross tons, as compared with 37,420 tons in May. The imports for the 12 months ending with June show a very heavy decrease. The detailed figures for the month and the 12 months are shown in the following table:

Imports of Iron and Steel.

	June,		Twelve months.	
	1905.	1904.	1905.	1904.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	17,117	4,062	123,034	191,135
Scrap	1,669	2,358	12,550	28,614
Bar iron	4,090	2,699	26,669	30,757
Rails	8,277	6,808	17,025	53,358
Hoop, band and scroll	232	2	1,918	1,820
Billets, slabs, bars, &c., steel in forms n.e.s.	910	637	9,800	91,953
Sheets and plates	231	223	2,108	10,198
Tin plates and terne plates	5 416	6,674	71,905	56,656
Wire rods	1,514	1,251	15,282	18,519
Wire and articles made from	258	210	3,851	4,953
Structural iron and steel	619	706	3,157	14,310
Chains	31	18	278	382
Anvils	21	2	176	249
Totals	40,385	25,650	287,753	502,914

The total value of imports for iron and steel in June, excluding iron ore, was $2,646,258, and the value of the exports was $11,820,655.

Professor Janssens has attempted to investigate the character of the gases given off by Mount Vesuvius in eruption, and has adopted an ingenious method to obtain his samples. His receptacles were lowered to a great depth and then the stopper removed by means of valves controlled from above. After obtaining the gas, the stopper was again placed in position by means of the same set of valves and the sample drawn up for analysis.

Central American Notes.

SAN JOSE, C. A., July 17, 1905.—Transportation of ocean freight is becoming a serious problem in Central American countries. Business is growing and there are hopes of new steamer lines being put on the Pacific to take the place of the Pacific Mail lines, still business men would like to see their freight moving more rapidly. Although they have not been fairly treated by the Pacific Mail Steamship Company, they would prefer additional American steamers if possible, as compared to the Chilean and other lines. It is unfortunate that those in charge of the Panama Canal work did not give proper weight to what has often been said in *The Iron Age* about living and general conditions on the Isthmus. Many lives would have been saved already, and an unsavory reputation would not have been the present lot of the canal, with regard to fevers and health conditions generally. If people would only recognize the fact that Panama is low land and that most of Central America is high land, then differences of climate would be easily understood. No white man can labor continuously on the canal, whereas in the high land they can work to advantage in many ways. Disorganization has always been the keynote about everything connected with the coast country; everyone seems to be either in a desperate or a dying condition. It is to be hoped that for business reasons these conditions will be well understood by the next man placed at the head of the canal work, and that generous pay be given to those who do the work there.

The new treaty between Chile and Bolivia gives the use of a good port to the latter nation on the Pacific, and Chile will build a railroad from the coast to La Paz, the capitol, thus throwing open a country which is as little known to commerce as is Thibet. Large quantities of mining machinery will be needed for the Sierra gold mining region; tin is found in commercial quantities in the Cordilleras; silver, copper, nickel, molybdenum and manganese are common. The railroad will also give life to the large rubber trade along the Madera and Mamoré rivers, all this region being virgin soil for our manufactures.

Although it may seem ridiculous for Colombia to try to start a rival canal, it is pretty certain that that country is really waking up to business activity. The new Government under General Reyes, who not long ago made a visit to the United States, is likely to do everything to unite American commerce and capital to his country, one of the largest and by nature one of the very richest sections in Spanish America. Cotton, tobacco, coffee, rubber, sugar and many tropical fruits could be grown in Colombia to great advantage. Railroads, bridges and wharves are needed all over the republic. The ports are good, but shipping facilities are bad. C.

Hulett Automatic Ore Unloaders at Lorain, Ohio.

Reference has been made in previous issues of *The Iron Age* to various installations of the Hulett automatic ore unloaders, invented by Geo. H. Hulett, third vice-president of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, sole builder of the machines. January 7, 1904, mention was made of the unloaders installed at the Lackawanna Steel Company, and in the issue of May 25, 1905, of those at the Pittsburgh & Conneaut Dock Company, Conneaut, Ohio.

The illustrations now presented show the latest installation of these rapid unloaders. They are located at the docks of the National Tube Company, Lorain, Ohio, and have a number of special features, largely necessitated by local conditions. In a measure they indicate the adaptability of design permissible in these machines to meet special conditions which may obtain at various ports. The Lorain docks in front of these unloaders, as Fig. 1 shows, are curved to such an extent that when the ends of a boat touch the dock the middle is about 12 feet away from the dock. The tracks on which the unloaders travel are correspondingly curved; hence some provision was necessary to enable the unloaders to be readily squared with any of the hatches of the boat. This is accomplished by mounting each machine on special swiveling trucks, thus enabling the leg and bucket to be easily squared with any of the hatches. The machines are provided with special cantilever extensions particularly designed for delivering the ore on the high bank back of the machines. A special point of difference between these machines and those previously built is that the walking beams are located at the top and the parallel bars below, an arrangement permitting of very advantageous distribution of the parts entering into the construction, and also simplifying the matter of counterbalancing.

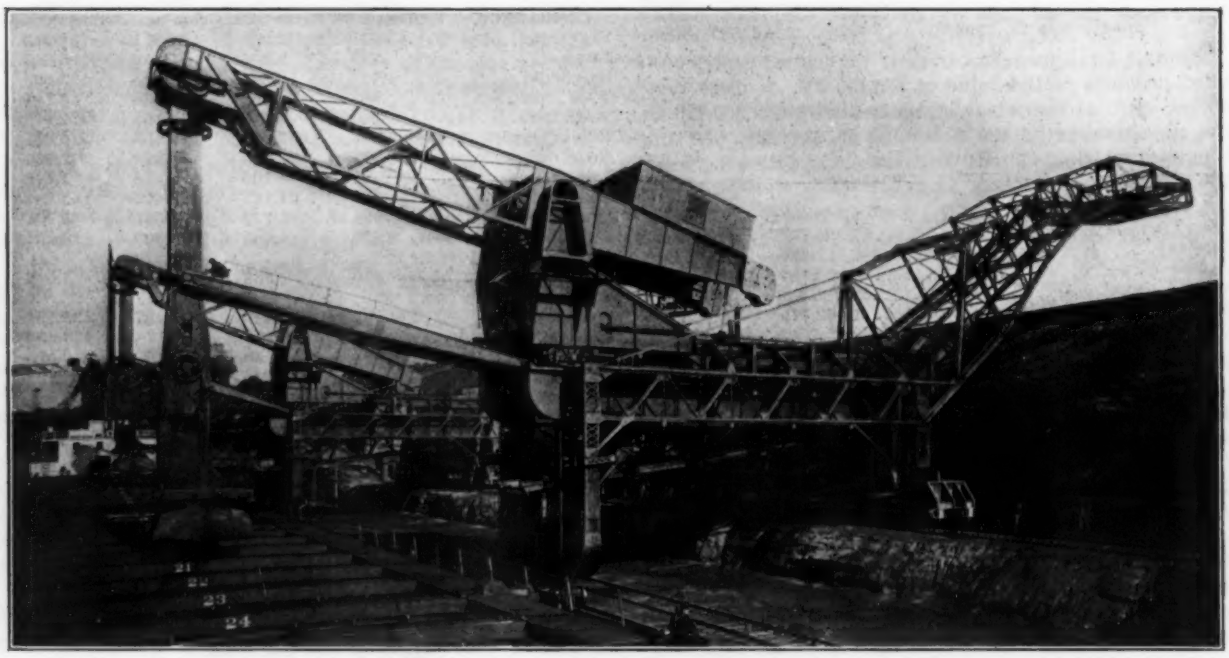


Fig. 1.—Hulett Automatic Ore Unloaders, Installed by the Wellman-Seaver-Morgan Company at the Lorain Docks of the National Tube Company.

The general operation of these machines is similar to that of previous installations. Each machine has two parallel girders at right angles to the face of the dock and mounted on moving trucks. On these girders a trolley or carriage travels back and forth carrying a

long pivoted walking beam. On the front or water end of the walking beam is carried a pendent leg, to which is attached the bucket. This leg is always maintained in a vertical position. The operator who controls all the motions of the bucket rides at the lower end of the leg directly above the bucket. By means of hoisting mechanism the walking beam is made to oscillate up and down, carrying the bucket down into the hold of the boat and up above the dock. The travel of the trolley back and forth on the girders carries the walking beam and the bucket out over the boat and back over the dock.

To reduce the trolley travel as much as possible suitable hoppers for receiving the contents of the bucket are mounted between the girders at the front. These hoppers discharge into an auxiliary bucket car, which travels back and forth on the cantilever extensions, carrying the ore back and dumping it on the high bank referred to before. A track passes beneath the machines near the forward legs, and when it is desirable the hopper or the bucket directly may be dumped into cars on this track. The bucket car is automatic in its operation, dumping itself at any point desired on the cantilever and returning closed to its position under the hoppers ready to receive another load. Fig. 2 shows one of the machines

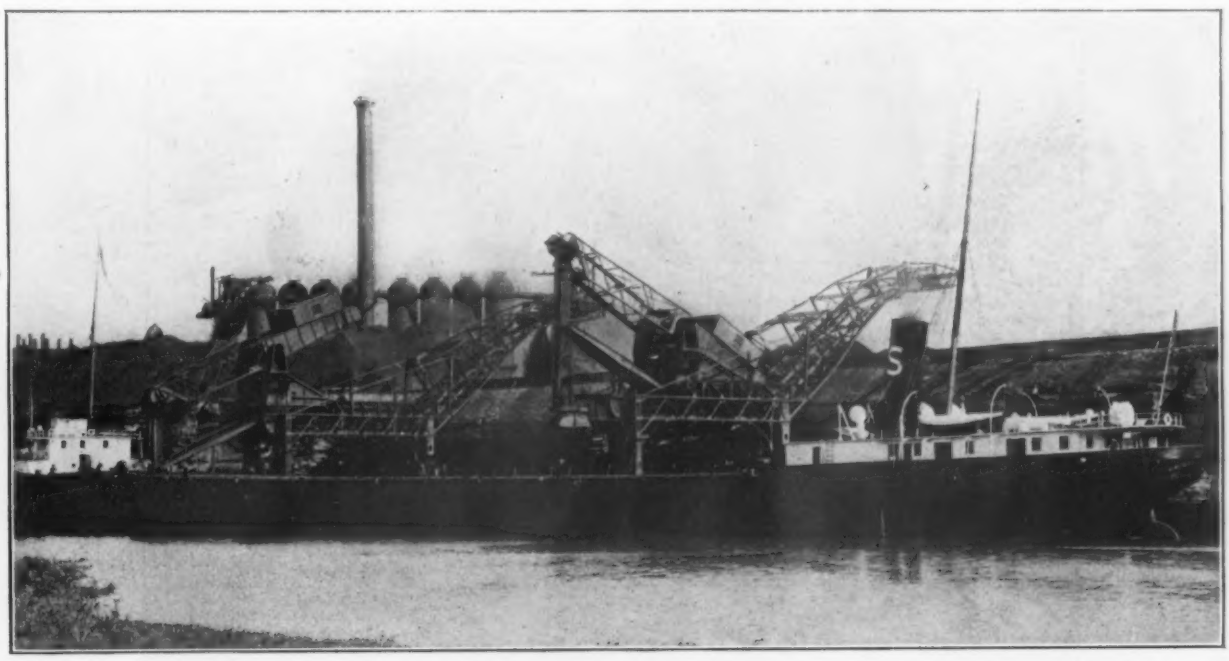


Fig. 2.—Another View of the Unloaders, Showing One Bucket in the Vessel's Hold and the Other Just Coming Out.

with the bucket leg raised and the other machine with the bucket down in the hold of the boat. The bucket car of the latter machine is in the act of dumping its load on the storage pile.

The leg of the unloader is located on rotating trunnions in the walking beam, so that it can rotate in a circle when operating in the hold of the vessel, allowing the bucket to reach out in all directions. The bucket is of 10 gross tons capacity and is opened and closed by specially designed motors. The total spread of the bucket when wide open is over 18 feet, and by telescopic motion it can be made to reach, when open, more than half way from the center of one hatch to the center of the other. It also travels lengthways of the hatch to the sides of the boat; consequently the operator is able to reach almost the entire cargo. In an ordinary boat there is no difficulty in reaching 90 per cent. of the cargo and in some of the modern boats the machines have actually unloaded 97 per cent. without the aid of shovelers.

The Hulett unloaders at Lorain are electrically operated, the power being supplied from motors which take their current through sliding contacts from rails laid along the dock. The motors for operating the bucket are 110 horse-power, those for hoisting the walking beam are 150 horse-power, for trolleying in and out 50 horse-power and for operating the bucket car and moving the machine 150 horse-power. Hoisting and trolleying are done simultaneously, speeds being figured to produce a round trip a minute. The controllers are of magnetic type, especially built for heavy service.

A New Steam Packing.—The troubles incident to the use of packing in mains carrying high pressure of superheated steam have brought about the common practice of making up such joints with machined flanges. It is a more expensive way, but has heretofore been considered the most economical in the long run. Recently there has been placed on the market what is known as the I X L steam packing, which is claimed to have unusual powers of resisting the action of superheated steam, acids, oils, ammonia or alkaline liquids. Excessive dry heat does not have so destructive an influence upon this packing as it does upon the ordinary commercial forms. The packing is easily applied, and is claimed to give absolutely tight joints for the highest pressures. It is recommended for use in the packing of cylinder heads and steam chests, as well as piping, and it is stated will not be pressed out or blown out from between the flanges. If properly applied at first it should not be necessary to tighten the bolts of the flanges afterward. It is believed to be the first nonmetallic packing capable of withstanding a pressure as high as 15 atmospheres or a temperature as high as 900 degrees F. Moreover it can be used with rough or unmachined flanges. It is made in all thicknesses and is light in weight for a given surface. The 1-16-inch thickness weighs only 5 pounds to the square yard. The packing is made by the I X L Steam Packing Mfg. Company, and the selling agents are Frederick Vietor & Achelis, 96 Spring street, New York City.

By his researches upon the capillary attraction of a glass surface upon gases Bunsen showed that the absorbing effect of a glass receiver might be greatly increased by the introduction of glass fibers or filaments into the bulb. This fact has recently been applied to the regulation of the vacuum in the Crookes tube. A little side tube fused into the bulb is stuffed with glass wool, which, when heated, operates at once to reduce the vacuum. This regulation is partially automatic, for when the anticathode becomes hot it radiates sufficient heat to set free some of the gas occluded in the glass wool and so keeps the tube constant, when in action, for a long time.

The Heald Cylinder Grinder.

In machine work the requirements are seldom more exacting than in the finishing of internal cylindrical surfaces of such parts as gas and gasoline engine cylinders. Very often the castings are of an irregular shape, making it difficult if not impossible to rotate them. Particularly is this true of duplex cylinder castings. The eccentric distribution of the weight is inimical to the working of accurate cylindrical surfaces under a cutting tool. Grinding is to be preferred, especially where the walls of the cylinder are thin in places, as the metal has a tendency to spring away from a cutting tool or reamer. To satisfactorily perform work of this character the Heald Machine Company, Worcester, Mass., has brought out a new cylinder grinding machine, upon which the work is held stationary while the wheel is given a planetary motion and a reciprocating axial motion, both adjustable in extent.

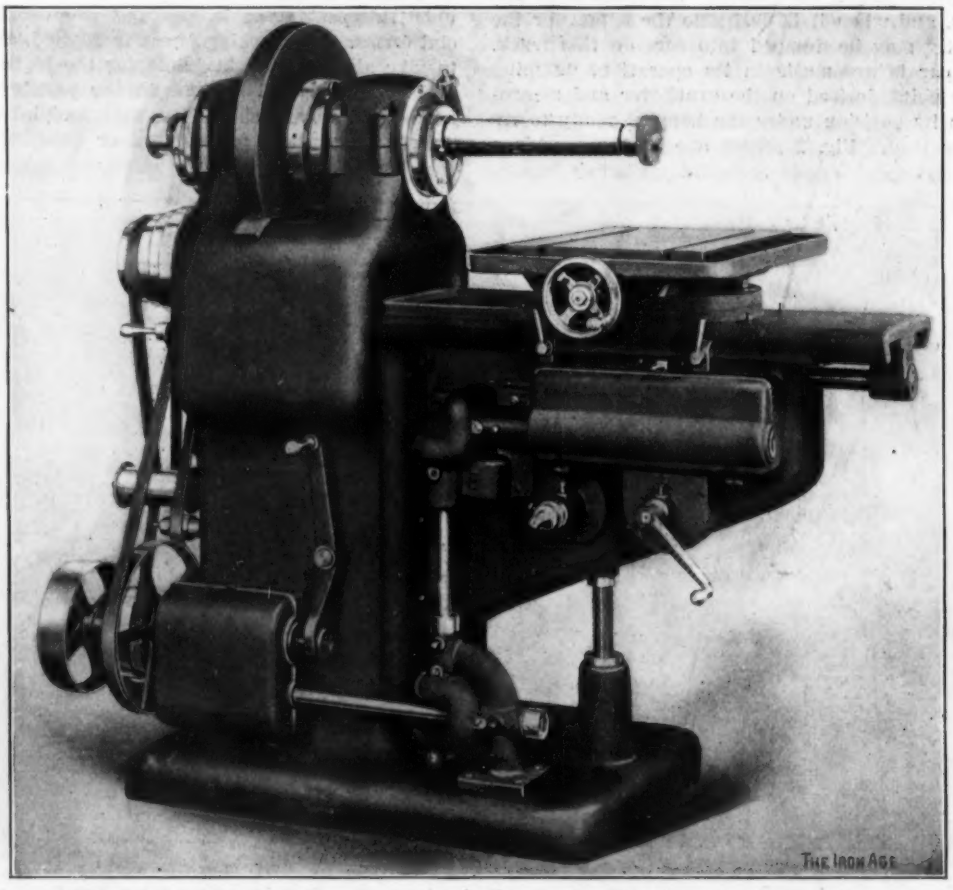


Fig. 1.—The New Cylinder Grinder with Planetary Wheel Action, Built by the Heald Machine Company, Worcester, Mass.

This machine will grind holes from 3 to 8 or 10 inches in diameter, by using the proper sized wheels, and any length up to 14 inches with the extension regularly furnished, but this can be increased if necessary.. The grinding wheel usually used is 3½ inches in diameter by ¾ inch face. The work is held in position by a jig or other fixture on the table, which travels in a line parallel with the driving spindle. The inner stroke brings the end of the table within the column, which is cut away for that reason. The table is in two parts, comprising a lower slide, 45 inches long by 13 inches wide, carrying the table proper, which is 20 inches long by 14 inches wide and has a transverse movement of 9 inches. The knee has a vertical adjustment of 4½ inches, which with the transverse movement of the table allows for the making of all adjustments. Micrometer indexes are provided for these adjustments, by means of which it is possible to grind duplex cylinders, maintaining the two holes in exact line, one with the other. One hole having been ground to size the table is moved transversely until the second hole is in line for grinding. The greatest distance of the main table below the center of the grinding circle is 12 inches.

An interesting feature of the machine is the mechanical arrangement for procuring the planetary movement of the wheel, as shown in Fig. 2. The grinding spindle A, carrying the wheel and running at a high rate of speed, is situated eccentrically in a second spindle B, which in turn is eccentric in a third or outer spindle C. The larger spindle revolves at a low rate of speed, carrying the spindle B with it. Consequently the wheel spindle rotates in an orbit, and the diameter of the hole being ground is always equal to the diameter of this orbit plus the diameter of the grinding wheel. The diameter of the orbit depends upon the relation of the two eccentrics. When the throws of these are opposed to one another the diameter of the orbit is a minimum and the grinding spindle is concentric with the outer spindle. In this condition the wheel would grind as if it were mounted on an ordinary spindle. When the eccentric B is revolved with respect to C the orbit of the grinding spindle becomes larger until the maximum throws of the eccentrics are combined, when the greatest diameter can be ground.

The lateral feed of the wheel to the work is accomplished by a worm gear, the worm wheel being mounted on the inner eccentric and the worm on the outer eccentric. The worm shaft carries a star wheel, and on the head of the machine is a spring dog against which the star wheel strikes as the eccentrics revolve. The feed is not automatic for the spring dog is out of the way except when held in position by the operator. To feed the wheel out to the work to regulate the depth of cut the operator presses the dog into position and each revolution feeds 1-1000 inch, that being the advance resulting from each action of the star wheel upon the worm and worm gear.

Eight speeds of the larger eccentrics are provided for different sizes of work, these being obtained through cone pulleys, as may be seen from Fig. 1. The belt driving the wheel spindle at the rear of the machine is kept taut as the driving pulley rotates in the orbit of the spindle by two idlers mounted on a swinging arm, which is weighted to preserve constant belt tension. The wheel spindle extends through the inner eccentric and is mount-

ed in bronze boxes, adjustable for taking up wear. The end of the wheel spindle is tapered to receive wheels mounted on collets, thus permitting wheels to be changed without delay for truing up. The table has an automatic reverse, by means of a dog operating a reversing clutch. Three rates of table speed are provided, the changes being procured in a gear box on the side of the column by means of the usual push spline mechanism. The machine occupies a floor space of 78 x 36 inches and is 56 inches high.

The Midvale Steel Company's Armor Plate Accepted.

WASHINGTON, D. C., August 1, 1905.—The first group of armor plate manufactured for the Government by the Midvale Steel Company has been accepted by the Navy Department, a representative plate selected by the inspectors have successfully passed the ballistic test prescribed by the specifications at the Indian Head proving grounds on July 25. The test plate is pronounced by the ordnance experts who were present as "a very excellent specimen of Class A armor—rather better than the average." The acceptance of this group brings the Midvale Steel Company forward as a successful competitor of the Carnegie and Bethlehem steel companies, and the Navy Department officials express the opinion that the Government will hereafter obtain its armor at a price considerably lower than that heretofore paid.

The Midvale Contracts.

The Midvale Steel Company on December 15, 1903, was awarded a contract for 6080 tons of armor at the rate of $398 for Class A, which includes all plates 5 inches or more in thickness. The bid of both the Carnegie and Bethlehem companies was $420 per ton. The first delivery under this contract was required to be made on or before August 15, 1905; therefore, the acceptance of the group referred to on July 25 enables the manufacturer to anticipate its agreement by three weeks. While preparations for the manufacture of this armor were being completed by the Midvale Company a second lot of armor was advertised, on which this company bid at prices ranging from $385 to $398 per ton, the prices of the Carnegie and Bethlehem companies being identical and ranging from $400 to $420. The ordnance officers being in doubt as to the ability of the Midvale Company to fulfill its first contract, recommended that this second lot of armor be divided between the Bethlehem and the Carnegie companies, but, after a special investigation, ordered by the President, it was decided to award 1000 tons to the Midvale Company, and this contract was executed April 5, 1905.

Several months ago the Midvale Company sent a plate to Indian Head to be tested privately for its own information. This plate met the ballistic requirements of the Department, but inasmuch as it did not represent a group of armor, the test had no bearing upon the company's contract. The quality of the plate, however, attracted the attention of the ordnance experts and caused much favorable comment.

Details of Ballistic Test.

The plate tested on the 25th ult. represented a miscellaneous group, aggregating 446 tons and including plates 3¾ and 6 inches in thickness. The plates are those which are first required in the construction of a war ship and which, though of different thicknesses, are usually thrown into one group. The ballistic plate was 9 x 6 feet by 6 inches and weighed approximately 9 tons.

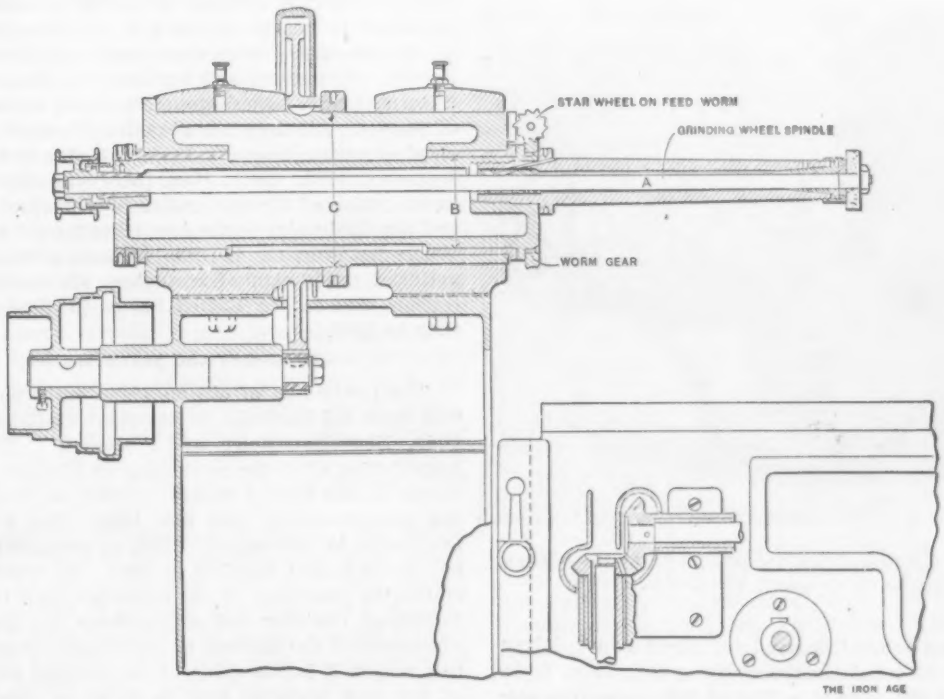


Fig. 2.—Detail of the Heald Cylinder Grinder, Showing the Mechanism for the Planetary Movement of the Wheel.

A 6-inch breech loading rifle and steel capped projectile were used with a striking velocity of 1658 feet. There were three impacts, one in the center of the plate and one each on a horizontal line on either side of the first impact and half way between the middle and the edge of the plate. About the usual penetration was noted as to each shot, or between 2½ and 3 inches. In each case the shell broke up on the plate and the point fused in the hole. There were no radial cracks and the backing of the plates was uninjured. The ordnance experts who examined the plate with special reference to the hardness of its face and the toughness of its back pronounced it practically identical in these respects with the plates heretofore supplied by the other manufacturers.

The officials of the Navy Department are naturally much gratified at the success of the Midvale Company in producing acceptable armor plate, as the additional competition is counted upon to save a large amount in the annual naval appropriations. The saving to the Government on the contract of December 15, 1903, will exceed $130,000, while on the 1000 tons assigned to the Midvale Company in April last the economy will be about $22,000.

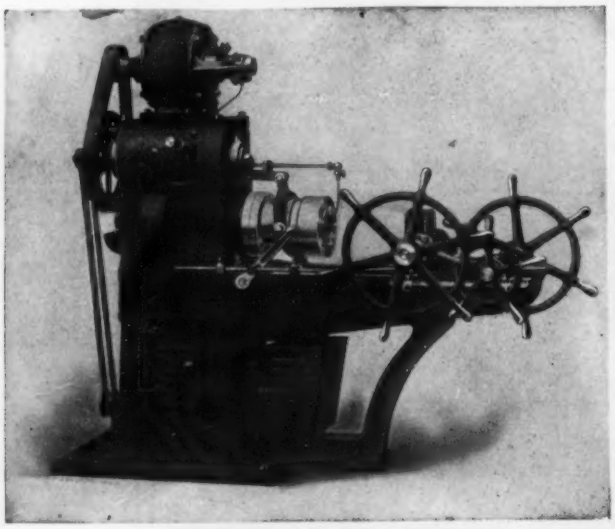
The Armor Plate Investigation.

The announcement of the success of the Midvale Company in producing acceptable armor plate has aroused renewed interest in the investigation ordered by Congress as to the cost of producing armor and the expense of

building a Government plant for that purpose. This direction was contained in the annual appropriation act, which provided that "the Secretary of the Navy shall cause a thorough inquiry to be made as to the cost of armor plate and of armor plant, the report of which shall be made to Congress." Under the law the Secretary could not begin this investigation before July 1, and the retirement of Mr. Morton and the appointment of Mr. Bonaparte has further delayed numerous projects authorized by the annual appropriation act. Nothing has yet been done with regard to this investigation, but it is understood it will soon be set on foot and completed in time for the report to be presented to Congress in December. M. C.

A National Motor Driven Bolt Threader.

Bolt threading machines are frequently placed in forge shops or in isolated places where it is inconvenient to transmit power to them. For this reason and because there is a general demand for direct motor driven machines, the National Machinery Company, Tiffin, Ohio, has placed on the market a line of bolt threading machines arranged for direct motor drive.



An 11½-Inch Motor Driven Bolt Threader, Built by the National Machinery Company, Tiffin, Ohio.

The accompanying illustration shows the method of applying the motor, and to make the equipment flexible the machines are provided with a speed change device, so that the proper cutting speeds can be secured even when the motor is of the constant speed type. The engraving is of a machine of 1½ inches capacity, and the gearing in the speed box provides four changes of speed, enabling the machine to handle work of all sizes within its capacity at the proper cutting speed. It is not necessary to use a variable speed motor, but if the utmost refinement is wished by using a motor having a speed variation a great range of cutting speeds can be secured.

In designing this line of machinery the aim has been to combine effectiveness with simplicity. A minimum number of gears are employed in the speed box, and all of the movements of the gears and the various speed changes are secured by the shifting of one hand lever only. The gears are of large size and wide face. There are no gears or pinions sliding on feathers, and no prong clutches are employed.

The motor as illustrated is connected to the speed box by a silent running chain, but as an option a raw hide idler and a direct gear drive may be furnished. By placing the motor over the head spindle of the machine the least floor space is required and the motor is out of the way of oil and dirt. All of the driving gears are incased. These machines are built in all sizes from 1 to 6 inches capacity, each size having a proper number of cutting speeds to handle the work for which it is designed.

Production of Abrasive Materials in 1904.

WASHINGTON, July 31, 1905.—The annual report of the United States Geological Survey on the production of abrasive materials in 1904, which has been compiled by Joseph H. Pratt, shows an output valued at $1,406,851, which is a decrease of $86,452 from the production of 1903. To the total value of natural abrasives should be added that of artificial abrasives, which in 1904 was estimated at $830,926, as compared with $493,815 in 1903, an increase of $337,111. The products covered by this report are divided into three groups: First, those which occur as a rock formation and are cut and manufactured directly into the form desired while retaining their original rocky structure and appearance, as grindstones, scythestones, &c.; second, those which occur as a constituent of either a rock or a vein and have to be mechanically separated from the associated gangue and cleaned, as corundum, garnet, &c.; and, third, artificial abrasives, as carborundum, crushed steel, &c.

There is considerable variation from year to year in the value of the different abrasives produced, and this represent in nearly all cases a corresponding variation in the quantity. There was a decline in 1904 in the production of oilstones and scythestones, but a large gain in grindstones and pulpstones, and also in the production of pumice. All the other abrasives, however, show a decided decrease, in some cases amounting to nearly 50 per cent. over 1903. As in 1903, there was again a decrease in the value of the production of corundum and emery, and the 1904 value is the lowest on record for any year. When, however, the imports of these abrasives and the artificial production of corundum are considered their consumption in the United States in 1904 was greater than in 1903.

Oilstones and Scythestones.

The production of oilstones and scythestones in 1904 was from old localities in Arkansas, Indiana, Kentucky, Ohio, New Hampshire and Vermont. There was a large falling off in the production of oilstones and scythestones in the United States in 1904 as compared with the productions of 1902 and 1903. The value of this production in 1904 was $188,985, as compared with $366,857 in 1903 and $221,762 in 1902. In nearly every instance the producers of the materials used in the manufacture of oilstones and scythestones are also the manufacturers of the finished or marketable product, and for this reason it is the value of the finished stones instead of the raw material that is given in these statistics. There was also a slight falling off in the value of the imports of oilstones and scythestones during 1904. The value of these imported stones in 1904 amounted to $61,609, as compared with $65,763 in 1903.

Grindstones and Pulpstones.

In 1904 the production of grindstones and pulpstones was confined to Ohio, Michigan, Wyoming, West Virginia, Montana and Missouri, given in the order of the value of their productions. By far the largest quantity was obtained from Ohio, and this was the only State that produced any pulpstones. The total value of all kinds of grindstones produced in 1904 was $881,527, which is $160,081 greater than the value, $721,446, of the 1903 production. This is the greatest value recorded for the production of grindstones in any year since these statistics were first collected in 1880. This represents a very large increase in tonnage as compared with the earlier productions, for it must be borne in mind in comparing the value of the productions of the earlier years with those of the last few years that the average value per ton for the grindstones has decreased from about $15 to $18 per ton to $8 and $11 per ton, these values not including pulpstones. A certain importation of grindstones into the United States is reported each year, principally pulpstones and a few grindstones that are used in the glass and optical trades. These stones are obtained from Newcastle-on-Tyne, and from Wales, Scotland and Bavaria. In 1904 the value of the imports of grindstones amounted to $93,152, as against $85,705 in 1903.

Buhrstones and Millstones.

From 1894 up to 1903 there had been a general increase from year to year in the value of the production of buhrstones in the United States, but in 1903 came a decline in the demand, and the decrease in 1904 was twice that of 1903. The total value of the production of buhrstones in 1904 was $37,338, a decrease of $15,214, as compared with $52,552, the value of the production in 1903, and $59,808 in 1902. Only four States produced buhrstones, or millstones, in 1904, with a total of 26 producers, as follows: New York, 17; Pennsylvania, 4; Virginia, 3, and North Carolina, 2. The imports in 1904 were valued at $32,386, as compared with $29,641 in 1903.

Pumice, Crystalline Quartz and Garnet.

The production of pumice in the United States during 1904 was from Nebraska and South Dakota, and amounted to 1530 tons, valued at $5421, or $3.54 per ton. This is an increase of 645 tons in quantity and of $2756 in value as compared with the production of 1903, which amounted to 885 tons, valued at $2665, or $3.01 per ton. There were four producers of pumice in 1904, two each in Nebraska and South Dakota. In 1904 the value of the pumice imported into the United States was $77,211, as against $83,920 in 1903 and $22,448 in 1902.

Only a small part of the crystalline quartz mined in the United States is used for abrasive purposes, the larger part being used in the brick and pottery, building and glass industries and as a flux in metallurgical works. The crystalline quartz which is included in this report is used principally as a wood finisher and in the manufacture of sandpaper, &c. In 1904 the production of crystalline quartz amounted to 31,924 net tons, valued at $74,600, as against 8938 net tons, valued at $76,908, in 1903. The reason for the apparently large decrease in value of the 1904 production of quartz as compared with the 1903 is that with the exception of 20 tons all of the 1904 production reported was of the crude, rough quartz, while of the 1903 production 8020 net tons, valued at $71,590, or $8.93 per ton, was a refined product, and only 918 net tons, valued at $5318, or $5.79 per ton, was sold in the rough.

The production of abrasive garnet in the United States during 1904 amounted to 3854 short tons, valued at $117,581, as compared with 3950 short tons, valued at $132,500, in 1903, a decrease of 96 short tons in quantity and of $14,919 in value, due to the smaller production of North Carolina corundum, such as has formerly been mined at the Sugar Loaf mine of Jackson County and put on the market as "ruby corundum." The average price of the 1904 production was $30.51 per ton, as against $33.54, the average price per ton of the 1903 production.

Corundum and Emery.

Although the demand for corundum and emery has been constantly increasing from year to year, this demand has not been met by a domestic production of these abrasive materials, but by the importation of foreign emeries and corundums and by the manufacture of artificial corundum. Since the discovery of the Canadian corundum deposits there has been a constant falling off in the production of corundum and emery in the United States, notwithstanding the discovery of the deposits in Montana. North Carolina and Georgia, which were the first States in this country to produce corundum and which for many years produced all of the corundum used in the United States (emery being excepted), furnished but little of the 1904 production. This production amounted to only 1932 net tons, valued at $57,235, as compared with 2542 net tons, valued at $64,102, in 1903, a decrease of 610 net tons in quantity and of $6867 in value. A small part of this production was due to corundum obtained from Montana and North Carolina. The emery was obtained principally from New York and Massachusetts, with a small quantity reported from Kansas. There continue to be imported into the United States emery and corundum largely in excess of the home production, and in 1904 these imports were valued at $260,424, as against $321,569, the value of the 1903 imports.

Carborundum.

The production of carborundum in 1904 amounted to 7,060,380 pounds, an increase of 2,300,490 pounds as compared with the production of 4,759,890 pounds in 1903. This is the largest production in any year since the beginning of the manufacture of this abrasive and illustrates the increasing demand for it. With the exception of one year, 1902, there has been a continual increase from year to year in the production and use of carborundum, and in that year the decrease was due to a scarcity of supplies used in the manufacture of the carborundum.

Crushed Steel.

The production of crushed steel in 1904 amounted to 790,000 pounds, valued at $55,300, which is the greatest production in any year since this abrasive was first put on the market. As compared with the production of 755,000 pounds in 1903 it is an increase of 35,000 pounds. The average value per pound of crushed steel is 7 cents, the prices of the different grades varying from 5½ to 10 cents per pound.

Alundum.

The manufacture of artificial corundum from a bauxite, developed to a commercial basis by the Norton Emery Wheel Company of Worcester, Mass., at its plant at Niagara Falls, N. Y., has met with great success. This abrasive, which is known commercially as alundum, is giving most satisfactory results. The greater part of this material produced by the Norton Emery Wheel Company is used by the company itself in the manufacture of its various emery wheels, stones, &c. There is another artificial corundum that is being used as an abrasive, but it is only obtained in small quantity, as it represents a by-product in the Goldschmidt thermit process. At present none of this corundum is made or put on the market in this country, but at the German factories where the Goldschmidt thermit process is employed it is utilized as an abrasive. In 1904 there were 4,020,000 pounds of alundum manufactured, only a small portion of it being put on the market in the crude form. It was sold at an average price of 7 cents per pound.

W. L. C.

An Ohio Coal Consolidation.—Several coal corporations owning properties in Ohio and West Virginia and employing 16,000 men have been consolidated in the Sunday Creek Company, which was organized in New York last week. The consolidation becomes effective from August 1. The companies included, which are largely owned in Columbus, Ohio, are the following, whose coal, railroad and dock property is expected to represent $50,000,000 capital in the Sunday Creek Company: Sunday Creek Coal Company, the Buckeye Coal & Railway Company, Ohio Land & Railway Company, Continental Coal Company, Kanawha & Hocking Coal & Coke Company, St. Paul & Western Coal Company and Boston Coal, Dock & Wharf Company. The stockholders elected the following directors: John H. Winder, president of the company, Columbus; C. W. Watson, president Fairmont Coal Company, Baltimore; S. P. Bush, vice-president and general manager Buckeye Steel Castings Company, Columbus; C. L. Poston, Athens, Ohio; E. A. Cole, Columbus; H. H. Heiner, vice-president, Columbus; Alfred Hicks, president Allegheny Steel & Iron Company, Pittsburgh; Louis B. Dailey of New Jersey.

Before the Iron and Steel Institute J. M. Gledhill stated that the famous Damascus steel was in reality nothing but a form of our modern high speed tool steel, for it contained all the important properties of the latter. Marvelous cutting powers have been attributed to it and recent analyses of the material show that it contained certain percentages of tungsten, nickel and manganese. This shows that a latent high speed steel was in existence centuries ago. All that was found necessary in order to bring out its inherent qualities was to "burn" it, a process which was long thought to destroy its usefulness, but which is now known to produce its greatest adaptability to the work in hand and render it capable of effecting a great revolution in machine shop practice.

A New Rubber Belt and the Machine for Making It.

Rubber belting as ordinarily manufactured consists of alternate laminations of rubber and closely woven fabric. The introduction of the fabric is largely incidental, its main purpose being to counteract the one objectionable quality of rubber for belting,—its tendency to stretch. Rubber itself possesses the other desirable characteristics, flexibility and pulley gripping power. With tensile strength provided by the fabric the common rubber belting would be very satisfactory were it not for the disadvantage that the layers of fabric and rubber are apt to separate.

As an improvement on the common rubber belting, William R. Smith of the Buffalo Weaving and Belting Company, Buffalo, N. Y., has devised a belt in which the relative importance of the rubber and the fabric may be said to have changed places, the latter being the more essential. Strength and flexibility are afforded in the fabric but for the best gripping action on the pulley surface the rubber is still depended upon. The rubber is also instrumental in protecting and preserving the fabric and greatly adds to its strength by increasing the cohesion of the fibers in the individual threads, much as the wax in a waxed end thread adds to its tensile strength.

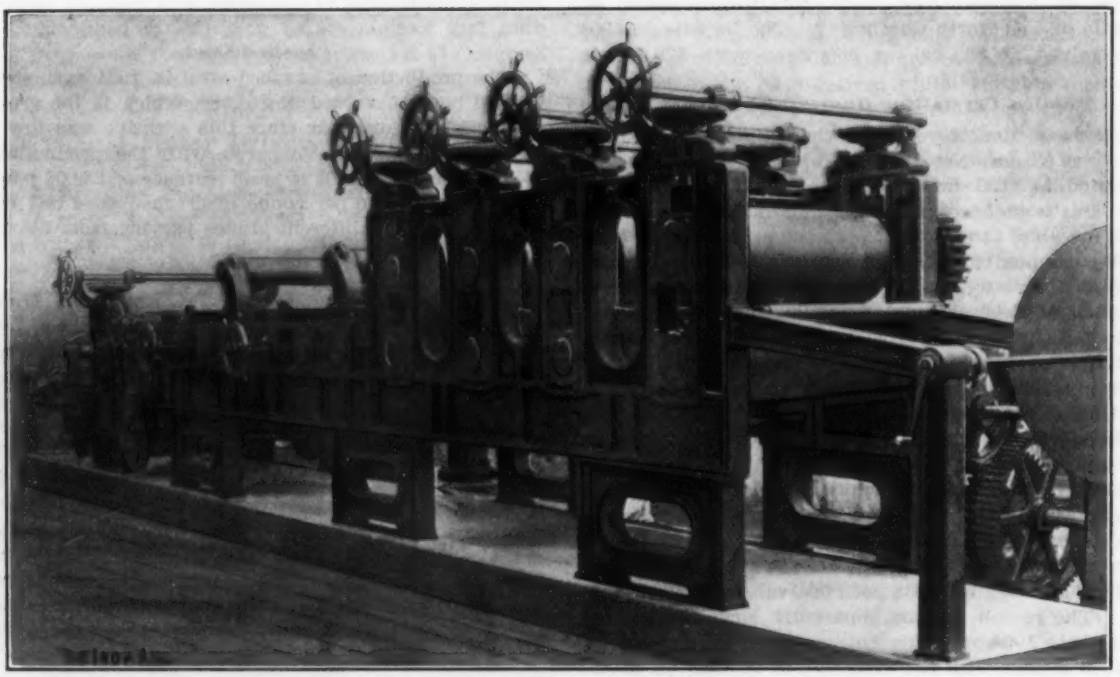


Fig. 1.—View from the Working Side of the Smith Fabric Treating Machine.

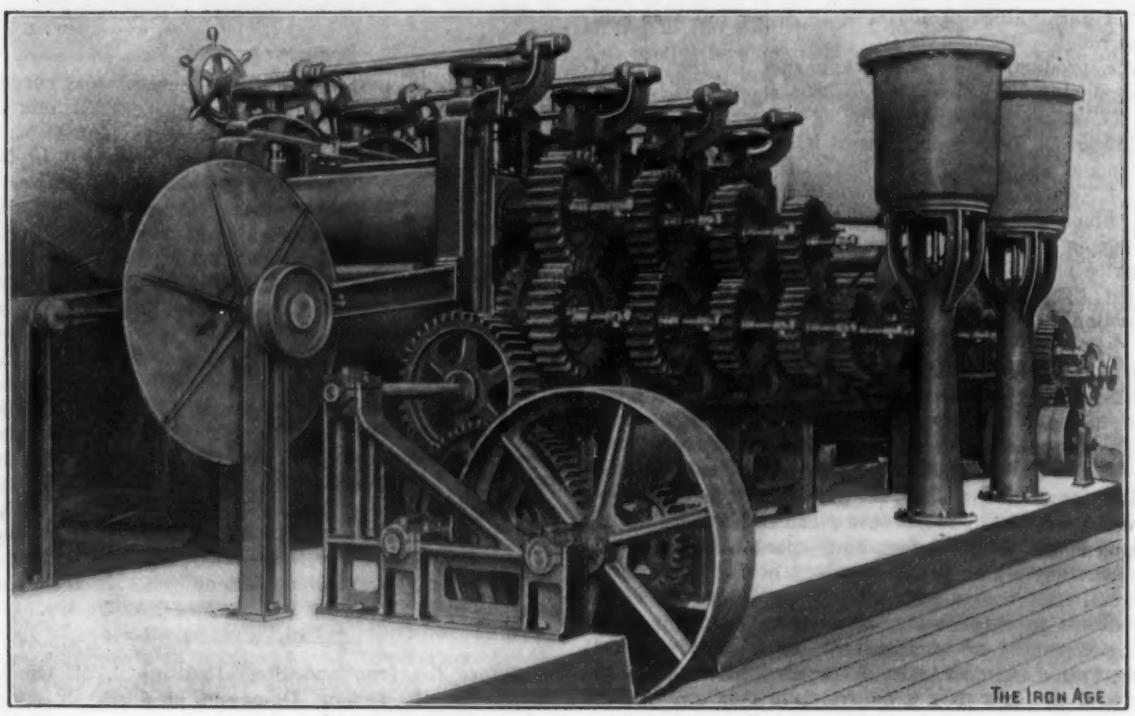


Fig. 2.—Rear View of the Machine as It Appears in the Buffalo Weaving & Belt Company's Works.

The fabric is not disposed in layers as in the older form of belting but is one continuous multiple-ply woven fabric, usually of cotton. In the process of its manufacture the fabric is stretched and dried to exclude all moisture and while in this condition is treated with a fluid or semifluid composition of rubber that is forced into all of the interstices of the fabric. The fact that the pores are larger than in the fabric formerly used, and that the moisture is first removed, makes it possible

to secure a more thorough penetration of the rubber into the material. The final process is the vulcanizing and smoothing of the exterior surface. It is unnecessary to carry this to the extent that is called for in laminated belting and the rubber may be left in a relatively soft and adhesive condition, which improves the frictional hold on the pulleys.

The machine illustrated is used in the manufacture of the belt and is also the invention of Mr. Smith. It comprises a series of adjustable steam heated rolls between which the solid woven or knitted multiple-ply cotton webbing is run. The rolls are all positively driven by gears, worm wheels and worms from a single shaft running along one side of the machine, as shown in Figs. 1 and 2. The sets of rolls *d*, *e*, *f* and *g*, Fig. 3, thoroughly dry and take the stretch out of the webbing, each succeeding set of rolls having greater surface velocity than the preceding set and a corresponding increase in temperature. The webbing is thus prepared for receiving the liquid rubber composition which is fed upon it from the steam-heated kettles or tanks *m* and *m*, as it passes through the center rolls *k*, *k* and *k*, *k*. These are designated "filler" rolls and are placed side by side instead of one above the other so as to form a shallow trough between each pair, allowing the liquid composition to be applied to both sides of the fabric. The ends of the trough are formed by flanges on one of the rolls in each of the sets, which run in corresponding grooves in the mating shaft so that its distance from the center of the disk may be varied, by a rock arm extending down to the floor, to which is connected a similar arm that bears yieldingly against the roll of belting. As the coil increases in diameter this rock arm is deflected, causing the friction driving wheel to move toward the rim of the disk of the reel. As the driving roller runs at constant speed, the speed of the reel decreases in proper proportion to maintain uniform tension on the belt.

The resulting belt has greater tensile strength, durability, adhesiveness and frictional power upon the pulley than ordinary rubber or other belting, will not stretch or shrink, and is impervious to the action of steam, hot water, salt water or acids. Owing to the use of the multiple-ply webbing there is no possibility of its blistering or separating. It is not affected by atmospheric conditions.

The machine now in operation, which is the one illustrated, is 50 feet long and weighs 87 tons. It is adjustable for making belting of widths up to 4 feet and any required thickness. It can be operated at a speed to produce a quantity of product in excess of the capacities with older processes and to make the cost of production moderate. The machine and the special process of belt making are covered by letters patent in this and foreign countries. These patents have been purchased by the Buffalo Weaving & Belting Company, which is placing the new belting upon the market. A machine capable of

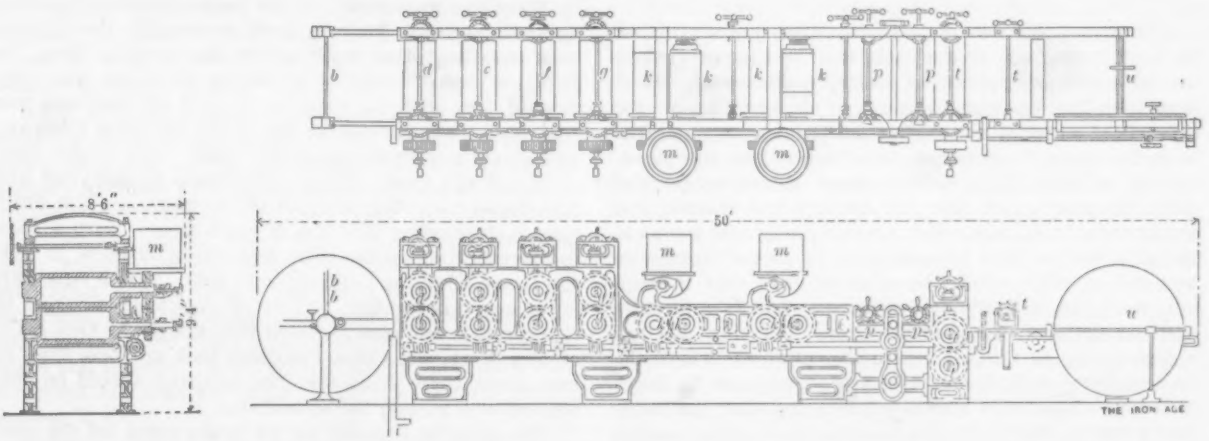


Fig. 3.—Elevations and Plan of the Smith Fabric Treating Machine.

rolls. In each set of filler rolls, the speed is still further increased to keep the belt stretched throughout its course through the machine. The rolls *k* *k*, are built up of rings so that it is possible to change the distance between the flanges which form the ends of the troughs, to accommodate various widths of belt. The thickness of the belt is determined by the distance between the rolls of each set, which is adjustable. After passing through the two sets of filler rolls and being thoroughly saturated and coated with the liquid rubber the belt passes between heated rubbing plates which have opposed reciprocating motions and serve to further force the filling composition into the fabric as well as to smooth and burnish the surface. The plates are actuated by slotted levers pivoted between the planes of the plates and driven at their lower ends by eccentrics. In going through the rubbing plates the rubber in the fabric is sufficiently vulcanized without destroying its pliability and adhesive quality.

The webbing is drawn into the machine from the reel *b* which is provided near one end with a flange to guide one edge of the roll. Its rotation is retarded by a friction brake, the tension of which may be regulated. The completed belt as it is delivered from the machine passes over a guide roll and is coiled upon the winding reel *u*. The winding reel is provided with variable speed drive to decrease the speed of rotation as the belt accumulates on the reel. The disk on the side of the reel guides the belt on its inner face and is driven on its outer face by a friction roller. This roller is feathered on its driving

producing belting 72 inches wide has been added to the equipment of the plant for making extra heavy conveyor belts.

Shipping Small Castings in Steel Barrels.—The Chicago Hardware Foundry Company, North Chicago, Ill., is shipping its small castings in steel barrels. These barrels weigh 48 pounds empty, and the company is given a very favorable return freight rate on empty barrels. When a barrelful of castings is shipped it is locked and the consignee is sent a key for unlocking. A tally of the contents of each barrel is chalked on the under side of the hinged lid for convenience in checking invoices. The shippers inform us that the system while involving some expense at the outset is economical in the long run, as it prevents many claims for shortage in count and also preserves the castings from damage in shipment. The barrels used by the company are furnished by the Cleveland Wire Spring Company, Cleveland, Ohio.

In recent tests on the crossing of rivers by the German army a horse artillery battery of the Fourteenth Regiment crossed the Rhine at Maxan with its guns. The *personnel* crossed in boats drawn by two, three or four horses swimming on each side, as in the cavalry. The guns were lashed in pairs on rowing boats, which had been boarded over, or were placed singly on rafts formed by empty casks attached to the wheels and were towed by rowing boats.

The Crane Company.

The Crane Company, Chicago, completed its half century of existence in July. The following history of its establishment and achievements will be read with interest:

In the spring of 1855 Richard T. Crane, a young brass molder and finisher, removed from New York City to Chicago, and after looking over the field and advising with his uncle, the late Martin Ryerson, opened a brass foundry in the corner of the latter's lumber yard. Work on the shop was completed July 3. Being anxious to see how the furnace and sand would work, and having some patterns ready, Mr. Crane took off a heat the next day, notwithstanding it was the Fourth of July. The sand used was found on the premises, and the first castings were couplings used in connecting lightning rods. Business prospects looking good, Mr. Crane sent for his brother, Charles S. Crane, who came in the fall, and who was connected with the business until 1871. Shortly after his arrival they decided to go into the making and finishing of brass goods. A foot lathe was purchased and the manufacture of brass engine trimmings begun. A few months later a room with power was rented, and the following spring a small three-story frame building was erected and equipped for power with a 6 horsepower portable engine. The next year jobbing in wrought iron pipe and fittings and steam warming work was taken up.

Little business was done in the three years previous to the breaking out of the Civil War because of the unsettled conditions prevailing. After the breaking out of hostilities the enormous demand of the Government for all sorts of material created a boom in business generally. Soon the brass plant had to be enlarged, and the manufacture of brass globe valves, check valves, steam and gas cocks was begun. An iron foundry was started, and the building, in a small way, of machinery and the making of a few articles belonging to the steam fitting line was undertaken. About the same time, in 1864, a small butt weld pipe mill, the first mill west of Pittsburgh, was built on the ground where the Crane Company still has a pipe mill. In the same year the property where the present brass department is located, known as 10 North Jefferson street, was purchased and the first malleable iron foundry outside of the Eastern States was started. This foundry was on the second floor, and is said to be the first instance of a foundry being placed above the ground floor. The manufacture of both malleable and cast iron fittings was commenced. The fitting industry was then in its infancy in this country. Most of the fittings used were wrought iron fittings imported from England. Not more than six or seven concerns were in the business in the United States, and their total output was small. About this time the three-way tapping machine was invented. Two with some original improvements were built by the Crane Company and installed in its shops—one for tapping ¾ inch and smaller, the other for tapping 1 to 2 inch. The few fittings required above 2 inch were threaded in a lathe. In connection with the fitting business the company early took up the manufacture of dies and die plates.

In 1865 the business was incorporated by Richard T. Crane, Charles S. Crane, Martin Ryerson, Eliphalet W. Blatchford and Charles N. Holden, and the name changed from R. T. Crane & Brother to the North Western Mfg. Company. This name was retained until 1872, when the title Crane Brothers Mfg. Company was adopted, which was changed in 1890 to Crane Company.

In 1870 the business had grown so that further extensions were necessary. The land west of the property at 10 North Jefferson street was purchased and a building erected thereon. Fortunately the company escaped the big fire of 1871, and the large increase that had recently been made in facilities enabled the company to take advantage of the heavy demand for goods created in the rebuilding of the city.

In 1881 another pipe mill was erected on property purchased on West Twelfth Place, where there were excellent railroad facilities. One lap weld and two butt weld furnaces were erected. In this mill the Siemens gas furnace was employed in the manufacture of lap weld pipe. Some years later the machinery in this mill was transferred to a mill in Pittsburgh and ultimately sold to another concern. The mill was then rebuilt, and the malleable iron and gray iron fitting departments were transferred to it, leaving larger space in the old buildings for the brass shop.

Although the Crane Company was concentrating upon the manufacture of valves and fittings, the continued growth of the business demanded extensive additions in 1891, 1899, 1900, 1902 and 1903, and this year a five-story modern office building has been erected. Not only has there been an immense increase in the floor space used for manufacturing purposes, but all the departments have been equipped with the latest improved machinery, much of which has been designed and built by the company.

As early as 1857 the company entered the steam warming field and the next year had a contract for the steam warming of the court house at Chicago. At different times the company manufactured heating coils, wrought iron pipe radiators, cast iron radiators and ventilating fans. Believing that it was not fair for the manufacturer to compete with the trade to which he was selling, the company retired in 1874 from the steam warming contract business. At the time the company went into the business very few buildings were equipped with steam heating apparatus. Many improvements were made in these appliances by the Crane Company.

Elevators were made by the Crane Company as early as 1867, and the business grew so rapidly that it was soon crowding other work out of the machine shop. In 1870 the manufacture of passenger elevators was commenced. In 1886 the elevator part of the business was separately incorporated as the Crane Elevator Company and given a complete plant by itself. The Crane Company and the Crane Elevator Company brought out and introduced ten different types of elevators and did much toward developing this line of machinery. With a view to concentrating on the valve and fitting business, in 1895 the Crane Elevator Company was sold. While Otis Tuft of Boston was the first builder of passenger elevators in this country, and was followed very closely by Otis & Co. of New York, the Crane Company took up these lines so soon after these firms that the company should be considered as a pioneer in the industry.

The growing demand for air brake parts led the company to undertake their manufacture, and by 1891 a full line of parts was carried. At the Columbian Exposition, 1893, the company exhibited a complete air brake equipment. The general business of the company was developing so rapidly, however, that the air brake business, being a distinct line in itself, was abandoned.

About 1865 the company took up the manufacture of pulleys, shafting, steam engines and steam pumps. A Corliss engine built by the company in 1879 was installed in the factory building at 10 North Jefferson street and has been in continuous hard service from that time to this day. Immediately after the great fire of 1871 Mr. Crane offered to put several Crane pumps along the river and force the water through the city mains. His offer was accepted, and the water thus pumped was the only fire protection the city had until the city water works was again in operation. At present the Crane Company does not manufacture machinery for sale. The company has, however, a machine designing department and a machine shop in which is built the special machinery needed in the business.

The company has from its infancy constantly added to the varieties and sizes of the products manufactured. Some of the important classes of goods put on the market in more recent years have been pop safety valves, drainage fittings, extra heavy brass and iron valves and fittings, hydraulic valves and fittings, ferrosteel flanged fittings and valves, ammonia fittings, steam traps, steam and oil separators, malleable and ferro-steel companion flanges, electrically and hydraulically operated and steam actuated valves, and a complete line of flat band fittings. In addition the company is prepared to turn out complete piping equipments for power plants and has facilities for bending and threading all sizes of pipe and screwing,

welding or rolling flanges on it. All told, the company manufactures in excess of 10,000 articles for use in connection with steam, water, gas or air. Persistent effort has resulted in greatly improving both the design and quality of the products manufactured.

A sketch of the Crane Company would not be complete without a description of the growth of its branch house system, which, by insuring large and steady sales, has enabled the company to devote its resources and energies to a single line of manufacture with the consequent result of being able to use highly specialized automatic machinery.

The first Crane Company branch was established in 1886 at Omaha. One year later branches were opened in Los Angeles and Kansas City. The success of these branches led to the determination to start others and make branch houses a permanent and important feature of the business. The branch houses carry stocks enabling the customer to get goods promptly and be assured of receiving uniform articles. In 1890 the first Eastern branch began business in Philadelphia. Other branches have been established in the following cities: San Francisco, 1891; Minneapolis, 1892; St. Paul, 1893; New York, 1894; Portland, Ore., 1894; Duluth, 1894; Sioux City, 1897; Oakland, Cal., 1898; Cincinnati, 1899; St. Louis, 1899; Salt Lake City, 1902; Seattle, 1902; Watertown, S. D., 1903; Chanute, Kan., 1903; Independence, Kan., 1904; Spokane, 1904; Fargo, N. D., 1904; Baltimore, 1904; Memphis, 1904; Dallas, 1904, and Birmingham, 1905. All the branches except New York carry complete stocks of plumbing supplies. The Chicago sales department, conducted in connection with the general offices, does not handle plumbing material.

While no special effort has been made to create a demand for Crane goods outside of the United States and their possessions, for the reason that the capacity of the company has been fully taxed in taking care of domestic demands, nevertheless they are sold in considerable quantities in Canada, Great Britain, Denmark, Mexico, South America, South Africa, Australia, Japan, China and Russia, and in smaller quantities in all countries of the world. The company was awarded the only gold medal given at the Paris Exposition, 1900, for exhibits of valves and fittings. Recently a European sales office and showroom has been opened at 95 Queen Victoria street, London, E. C.

Richard Teller Crane, the founder and president of the Crane Company, was born in Paterson, N. J., May 15, 1832. From his father, who was a man possessed of unusual mechanical ability and ingenuity, he inherited a pronounced aptitude in the same direction. His father died in 1845, and his mother seven years later. The family being too poor to give the children much of a school education, they went to work at an early age. After having for six years done other work, Mr. Crane, in 1847, began work in John Benson's brass shop, Brooklyn, where he spent two years in the foundry and a like period in the finishing department. Then, feeling that the brass business was not exactly to his liking, he went to New York City, where he obtained employment in the machine shops of the Taylor Printing Press Works, and later in the shops of Hoe & Co. His natural mechanical ability soon enabled him to earn the wages of a journeyman machinist. As a result of the business depression of 1854, Mr. Crane was thrown out of employment. Being unable to secure a new position, he decided to go to Chicago, where he opened the small brass shop, in the loft of which he lived, from which has grown the Crane Company of to-day.

His policy from the first was to put his earnings back into the business, and he had sufficient courage to extend the business as rapidly as his means permitted. The panics of 1857 and 1865 found the company in a greatly expanded condition, and an exceedingly severe struggle was necessary in each case to weather the storm. By 1873 the company had gained such financial strength that the panic of that year, as well as the later panic of 1893, was passed without the business being seriously threatened. Although the company started without resources, and the business has been extended and many financial difficulties encountered, never during the 50 years has the company's paper gone to protest.

Mr. Crane early saw that in a highly specialized industry like the valve and fitting business the manufacturer constantly must be designing and building labor saving machinery, must be always improving the quality and design of the goods produced, and must bring out new lines of goods as rapidly as the growth of business demands. With these facts ever in mind he devoted himself assiduously to the study of the mechanical features of the business. He early recognized the importance of system in business, and was one of the pioneers in that line of industrial effort.

He has always taken a lively interest in the welfare of his employees. Prior to the establishment of a pension system by the Crane Company Mr. Crane personally pensioned employees whom sickness or old age had overtaken without their having been able to lay by enough to support themselves and their families. Through the company in 1899 Mr. Crane gave to each employee 5 per cent. of the total amount the employee had earned during the previous year as a New Year's present. This has been the practice each year since, except that last year and the year before the amount was 10 per cent., instead of 5. He has always taken an active interest in social, economic, political and educational affairs and has been prominently identified with many important movements. He is a student and writer upon educational problems. In his articles and pamphlets he places great emphasis upon the distinctions between an educational system adapted to meet the wants of the masses and a system suitable for training a favored few. He lays great stress upon the importance and practical value of manual training in the grade schools. In September, 1892, he equipped a manual training room in one of the Chicago grade schools and employed a special teacher to give instruction in wood work in the higher grades of several of the schools. In 1900, recognizing the success of his first experiment, he provided the necessary means for making possible manual training in the lower grades. This year Mr. Crane has provided 24 scholarships, of $300 each per year, to enable young men to prepare themselves as teachers of manual training, and has provided the funds for opening manual training departments in five more grade schools. In recognition of his interest in the public school system the Chicago Board of Education has recently named a new school the R. T. Crane Manual Training High School.

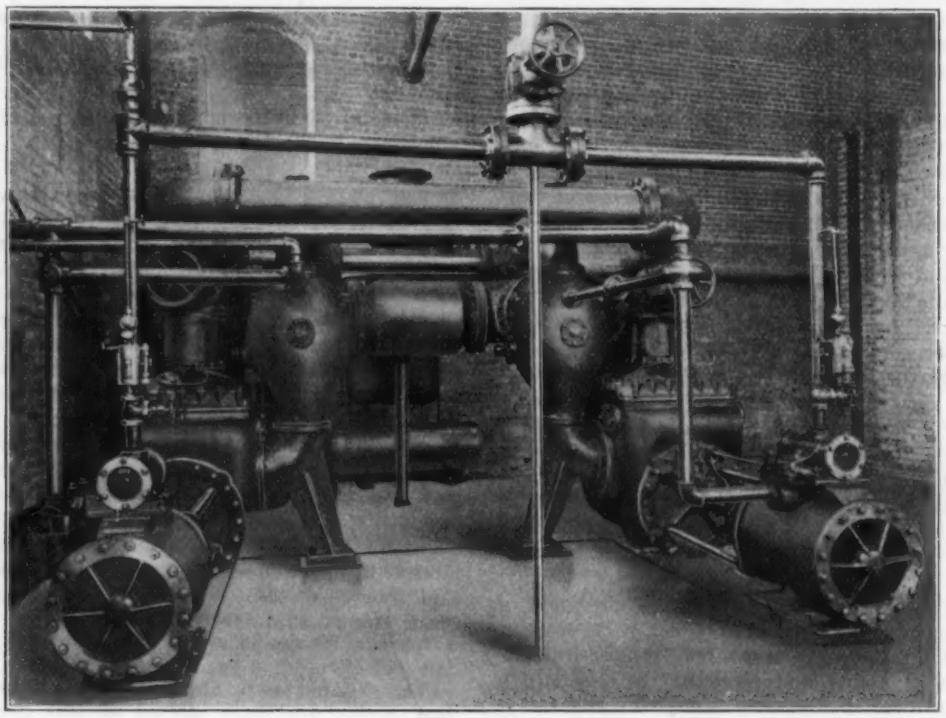
The Youngstown Sheet & Tube Company.—Last week active work was started on this company's new Bessemer steel plant at Youngstown, Ohio, and James A. Campbell, president, states that work will be pushed as fast as possible. It is hoped to have the plant ready for operation in July, 1906. The first building to be erected will be the cupola building, which will be located between the present works and the river. The different departments of the plant will then follow in line, starting with the blooming mill, billet and sheet bar mills in the order named. The present works consist of a puddling mill, sheet bar mill, six sheet mills, a skelp mill and four tube mills, of which two are lap weld and two butt weld. The annual meeting of the stockholders was held last week and the following directors were elected: James A. Campbell, H. G. Dalton, George D. Wick, William Wilkoff, H. H. Stambaugh, E. L. Ford, John L. Severance, C D. Hine, Robert Bentley, Richard Garlick and J. G. Butler, Jr. The directors organized by electing James A. Campbell, president; William Wilkoff, vice-president; George E. Day, secretary and general sales agent, and Richard Garlick, treasurer. W. C. Reilly is general superintendent of the entire plant. The operations for the past year were very satisfactory, the tonnage turned out being much the largest in any one year in the history of the company.

The State Canal Board has decided that the locks of the $100,000,000 barge canal system shall be 45 feet in width and 12 feet deep instead of the original plans, which provided for locks 28 feet wide.

A Two-Unit Installation of Jet Condensers.

In a manufacturing plant which is run continuously at its full capacity a brief shut down is always serious. For this reason it is desirable to have as many parts of the plant as possible installed in duplicate, so that one part may be shut down for inspection or repair while its companion part continues to operate. Such a duplicate arrangement to cover emergencies is especially desirable in a condensing plant, and has been adopted in the condensing equipment installed for the Standard Sanitary Mfg. Company, New Brighton, Pa., by the Union Steam Pump Works, Battle Creek, Mich. It comprises a two-unit jet condensing pump, shown in the accompanying illustration, which consists of two 18 x 22 x 24 inch Burnham jet condensers, each capable of caring for the entire work.

This arrangement does not double the cost of the plant, as the pumps and condensers may be so proportioned that when one-half unit is handling the entire load it will operate at a speed considerably higher than its normal speed. Under these extraordinary conditions the condensing plant would not be expected to maintain quite as high a vacuum as with both units in operation, but a loss of 2 or 3 inches vacuum would not reduce the value of the condensing plant to a very great extent, particularly if these conditions occurred only occasionally. On the other hand it would be undesirable to put in two condensing plants of sufficient capacity to maintain the highest vacuum when running independently.



The Duplicate Burnham Jet Condensing Equipment in the Standard Sanitary Mfg. Company's Plant, New Brighton, Pa.

The pumps are arranged so that they may be used alternately or together, and have combined capacity sufficient to condense the steam from a 20 x 42 inch Corliss engine, a 13½ and 24 x 18 inch compound condensing Skinner engine, a similar engine with cylinders 10½ x 19 x 18 inches, a compound high pressure 15 x 28 x 16 inch air compressor and a 14 x 18 inch duplicate air compressor. The maximum temperature of the water is 80 degrees. Each machine is capable of condensing 20,000 pounds of steam per hour.

The duplicate arrangement is of advantage also in that it allows the engineer to use his discretion as to the speed at which the pumps should run to obtain the best results, and that it permits him to run either one or both pumps, depending on the load carried. If the load is light one pump only need be operated, which reduces the wear and tear on the plant. During the part of the day when the load is heavier both pumps may be put into commission and operated at a reasonable speed with the assurance at all times that if an unforeseen accident happens to either pump the other may be called upon to do the work of both until the damage has been repaired.

The Iron and Steel Institute.—At the forthcoming autumn meeting of the Iron and Steel Institute, to be held at Sheffield from the 26th to the 29th of September, the following papers will be offered for reading: "The Metallurgical Department of Sheffield University," by Prof. J. O. Arnold, Sheffield; "The Thermal Transformation of Carbon Steels, by Prof. J. O. Arnold and A. McWilliam, Sheffield; "The Nature of Troostite," by Dr. Carl Benedicks, Upsala; "The Occurrence of Copper, Cobalt and Nickel in American Pig Irons," by Prof. E. D. Campbell, Ann Arbor, Mich.; "Pipe in Steel Ingots," by J. E. Fletcher, Sheffield; "Steel for Motor Car Construction," by L. Guillet, Paris; "The Presence of Greenish Colored Markings in the Fractured Surface of Test Pieces," by Capt. H. G. Howorth, Sheffield; "Overheated Steel," by Arthur W. Richards, Grangetown, and J. E. Stead, Middlesbrough; "Segregation in Steel Ingots," by B. Talbot, Middlesbrough; "A Manipulator for Steel Bars," by Douglas Upton, Jarrow; "Machinery for Breaking Pig Iron," by Cecil Walton, Whitehaven; "The Influence of Carbon on Nickel and Iron," by George B. Waterhouse, New York. A very large number of works in the Sheffield district will be visited, including Hadfield's Steel Foundry Company, Firth & Co., John Brown & Co., Limited; Cammel, Laird & Co.; Vickers, Sons & Maxim; Steel, Peach & Tozer; Parksgate and Sheepbridge.

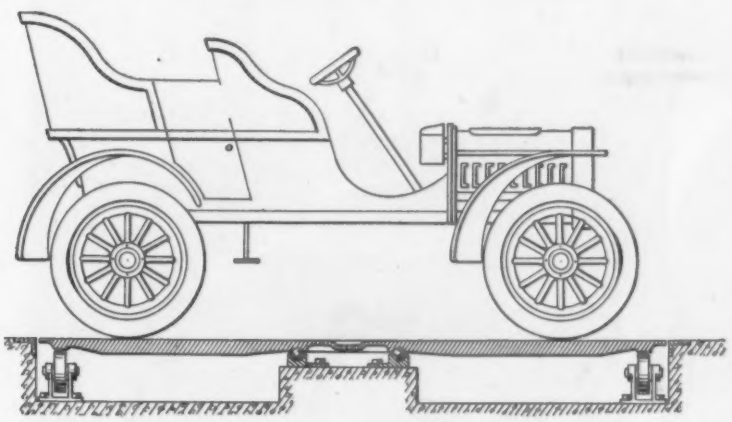
Professor Bach has made some experiments to determine the effects of high temperature on the strength of steel, using groups of four bars each. The temperatures of the testing of the several groups were: Atmospheric, 390, 570, 750, 930 and 1020 degrees F. On one bar the test at ordinary temperature showed a strength of 54,000 pounds per square inch and an elongation of 26.3 per cent. The strength appeared to increase with rise of temperature, until at 750 degrees the figure stood at 60,300 pounds, while above this temperature the strength decreased rapidly until at 1020 degrees it was only 26,000 pounds per square inch.

An Automobile Turntable.

To facilitate the handling of motor cars in garages and factories the Link-Bolt Engineering Company, Nicetown, Philadelphia, Pa., has devised a neatly constructed turntable, a sectional view of which is given. Being fitted at its center with ball bearings and supported at the outer edge upon rollers it is very easily operated. The device is set flush with the floor in a concrete pit having a center pier upon which the ball race is bolted. The sharp edge between the wall of the pit and the floor is protected by an angle iron ring, or curb, which prevents breaking away of the concrete.

The pit is only 12 inches deep, making the expense of excavating and cementing small. The turntable is 10 feet in diameter, which is ample for the handling of a car with a wheel base of 108 inches. When the turntable revolves or is at rest its surface is maintained at a level with the surrounding floor. The table is of cast iron 1 inch thick, stiffened with radial ribs on the under side. The rollers are 6 inches in diameter. Hand holes with flush tops are provided in the table. A brake recessed into the floor and the top of the table, so that it is no obstruction, affords a rigid fastening when the table is not in use.

As the pit is drained the table may be conveniently used when machines are being washed off. The work is quickly accomplished and the attending annoyance of such work, usual to the old way of maneuvering, is eliminated. The turntable is entirely of construction that is proof against fire, such as might be caused by the igniting of dropped oil or waste on a wooden table.



Sectional Elevation of an Automobile Turntable, Made by the Link-Belt Engineering Company, Philadelphia.

Some Cases of Hard Cast Iron.*

BY HENRY SOUTHER, HARTFORD, CONN.

A consulting metallurgical engineer in contact with machine shops is accustomed to hear complaints from the operators of machine tools of hardness of material being machined. Sometimes it develops, especially with steel, that the trouble is not that the steel is hard, but that it is exceedingly soft. The softness is of such a character that the edged tool does not succeed in cutting the steel keenly, but rather tears it off, some of the particles clinging to the edge of the tool, causing excessive friction and rubbing and drawing the temper of the tool so that dullness soon follows. The effect, as far as the machine operator is concerned, is that of a hard steel; the tool is spoiled. This not only applies to low carbons but to a peculiar physical condition of higher carbons, say in the neighborhood of 0.50, due to bad annealing. Then there is the legitimate hard steel, which is really hard in the true sense of the term.

Cast iron that chills may be called hard in the truest sense of the word. That is the complaint that is most often met with when the term hardness is used in connection with machining cast iron. Iron chills because of high sulphur or low silicon, or a combination of both, and machine tools cannot cut it. This kind of hardness is more often found in thin work than in thick work. For example, the hardware people casting very thin material have to use the softest of iron, high silicon and low sulphur, in order that the small amount of machining they do may be done at all.

In the last five or six years three separate complaints of hard iron have reached the writer and proved of so baffling a character that in each case visits were made to the machine shops working the iron and the complaint carefully investigated. Neither analysis nor test revealed the cause. The most instructive case covers them all. This instance was most instructive because it occurred on a multiple drill where several different sizes of standard drills were used and several thicknesses of metal were involved. On approaching the machine it was noticeable at once that there was trouble, because the drills were screeching in an unusual way.

It developed that small drills, ¼-inch or thereabouts, were standing up with this iron just as well as any other, but the larger drills in the neighborhood of ½-inch and ¾-inch were dulling exactly as though the iron were charged with emery. The edges were being ground off and would last only a fraction of the time usual for the same drills in the same machine. Here was an unusual condition—thin iron working easily, thick iron on the same castings working with difficulty.

The chemical results were normal, except manganese—silicon, 2.50; phosphorus, 0.70; sulphur, about 0.080; total carbon, 3.50, and manganese, 0.16. The fracture of the iron was good, and, moreover, it was quite normal as far as could be seen with eye or microscope. A Keep's test drill was used and developed nothing unusual, no signs of hardness, thick and thin iron showing a normal curve. There was no opportunity to test the tool wearing qualities on the Keep machine, because the drill was sharpened after every hole drilled. Inasmuch as the only abnormal part in the analysis was shown in the manganese that element was suspected, although there seemed to be no metallurgical reason for so doing. Means were taken to raise it to the neighborhood of 0.50, and as soon as this was done the difficulty disappeared in the machine shop and has not reappeared after some months.

It is a complaint which reached me, as I said above, from two other sources, and in both of those cases the machine shop people said that the iron was "gritty." They were fully convinced that there was sand in it, but examination showed that to be out of the question, and the iron was as clean as any iron. This leads me to believe that there must be some carbide of iron or carbide of silicon that forms in the absence of a reasonable amount of manganese and that does not form with manganese present. What this chemical combination may be I cannot surmise, but the problem presented is an interesting one from a theoretical and practical standpoint. Apparently its cure has been found, but the question remains, Why?

The actual castings causing this trouble were put through and no specimens kept, so that the writer can furnish no samples for study; but this is doubtless something that comes before the other members of the society, and although specimens may not be easy to get they can doubtless be found.

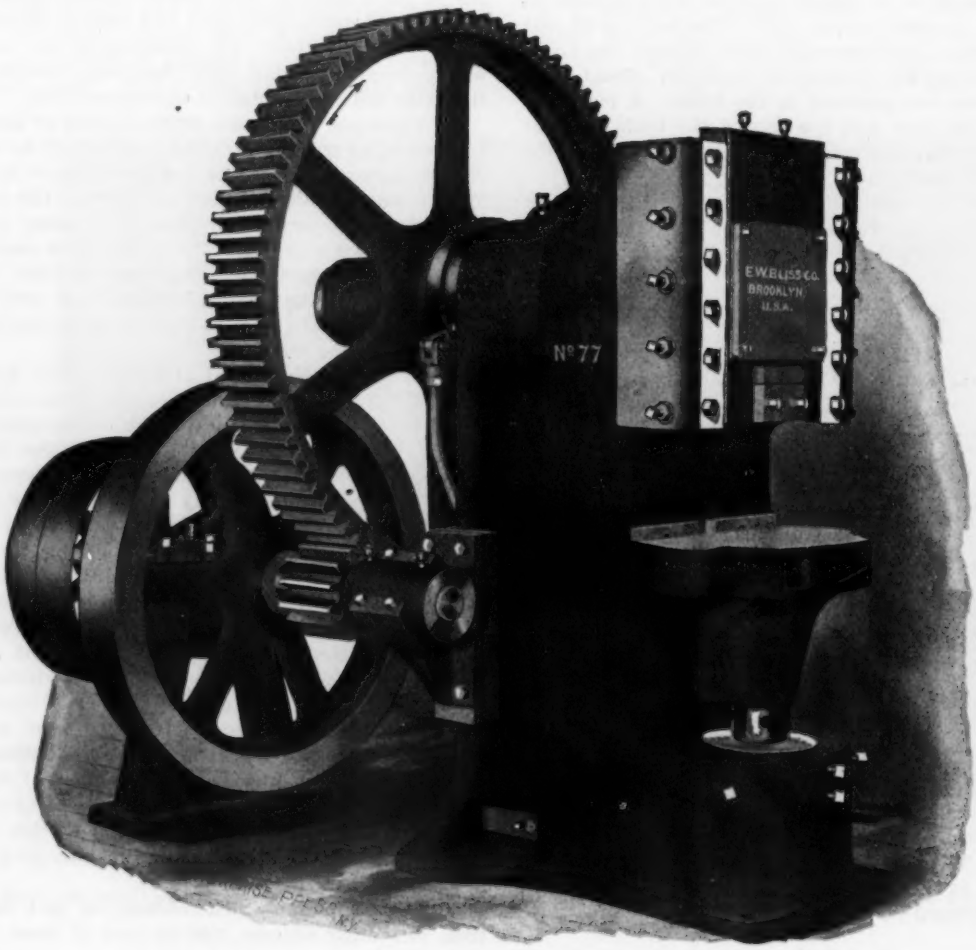
* A paper read at the Atlantic City meeting of the American Society for Testing Materials, June, 1905.

The Western Iron Company, South Bend, Ind., dealer in scrap iron, is moving its headquarters to Detroit, Mich., having purchased the entire plant of the Caplan Iron & Steel Company at 300 Franklin street, Detroit. H. S. Grant and A. C. Appleb-um, proprietors of the company, have taken in as a third partner J. Roth.

A Bliss Powerful Punching Press.

A new type of power press adapted for heavy punching, cutting, stamping, &c., is shown in the accompanying engraving and is a product of the E. W. Bliss Company, Brooklyn, N. Y. It is particularly serviceable in the manufacture of some of the fittings for electric motors and dynamos, but is also adapted for a great variety of other work requiring an exceedingly heavy pressure.

The frame of the press is a solid casting of compact design, weighing about 15,000 pounds. The plunger shaft is of large diameter, has a stroke of 1¾ inches and is directly connected with the slide without means for adjusting. Adjusting is effected by raising or lowering the bed, which is well gibbed and securely bolted to the frame by large bolts, and in addition is supported on a very heavy screw of large diameter. This screw gives a vertical adjustment of 1 inch to the table and is securely locked in any position by two set screws which bear on a threaded key. By this construction the bed of the press is made extremely rigid and is easily capable of withstanding the severe strains put upon it.



A New Type of Heavy Power Press, Built by the E. W. Bliss Company. Brooklyn, N. Y.

The press is powerfully geared and is controlled by an automatic jaw clutch, which positively locks the large gear wheel to the shaft and automatically releases it after the press has made one revolution. A feature of the press is to be found in the length of the slide. This is carefully scraped and fitted with long gibs and guides the punches which it carries accurately, thus insuring long life to the dies. The bed of the press has an area of approximately 17 x 20 inches. The distance between the gibs is 16 inches and the depth of throat 6 inches. The total weight of the press is about 17,500 pounds.

London's fogs are stated to be largely due to the steam escaping from the large number of locomotives and steam generating stations within the city, and a plea is made for the substitution of electrically operated machinery as a means of at least partially abating the nuisance. It would, of course, be entirely feasible to prevent this escape of steam from most of the stationary plants by the simple expedient of requiring all such plants to exhaust into condensers, to the undoubted economy of their operation, as well as a reduction of the fog. As to the locomotive, plans are already on foot looking to its banishment from the city, electric traction within the metropolitan district being substituted.

The Scranton Steam Pump Company Buys a Steel Building.—The Real Estate Trust Company, Pittsburgh, through Wilbur L. Slack, manager of its manufacturing and industrial department, has sold for the American Bridge Company the structural steel building formerly occupied by its Walker Works, at West Homestead, to the Scranton Steam Pump Company, Scranton, Pa. The building measures about 120 x 280 feet and contains about 200 tons of steel. The plant of the Pump Company was recently destroyed by fire. The building just purchased will be removed to Scranton. By doing this the company will save valuable time, as it expects to have the building erected and machinery installed in about 30 days.

All records for immigration to the United States were broken in the year ending June 30, 1905. The arrivals in that period were 1,027,421. The previous high figure was in 1903, when the total was 857,046. There were more immigrants last year than in the entire four years 1894, 1895, 1897 and 1898. The largest number came from Austria-Hungary, 275,693. Italy for the first time in six years dropped to second place with a total of 221,479. Russia was third, with 184,997, and Great Britain fourth, with 137,057. Since 1820 the total number of immigrants arriving in the United States has been 22,932,905.

The Greenaway Steel Plate Receiver Separator.

One of three plate steel receiver separators built by the Greenaway Separator Company, Detroit, Mich., for the Sharon Steel Hoop Company, Sharon, Pa., is shown in Fig. 1. These separators are known as type E, and were furnished by the manufacturers to the Pittsburgh Valve Foundry & Construction Company for installation in the Sharon plant. The receiver is 10 feet 10 inches high and 4 feet 4 inches from face to face of flanges. It was tested before shipping to 600 pounds hydrostatic pressure. The shell is formed of one piece of flange steel, riveted.

Fig. 1.—Large Type E Steel Plate Receiver Separator, Built by the Greenaway Separator Company, Detroit, Mich.

Fig. 2, which illustrates a type C separator made by the same company, shows the interior construction which is also used in the larger type E separator. It will be observed that the machine is devoid of the ordinary baffle plates and that the deflectors used are so arranged that separation is accomplished mainly by gravity. The steam entering on the right side of the separator meets the deflector plate, and the water, being heavier than steam, has a tendency to continue on a straight line from the deflecting point. At the waist of the machine is placed a grating consisting of a series of bars placed at the same angle as the inlet deflector. Water which falls from the inlet deflector is thrown into contact with this grating and is prevented by the grating from rejoining the steam. Owing to the position of the members of the grating the water drops by gravity into the receiver chamber.

Three tests made by the University of Michigan a little over a year ago show that steam containing respectively 17.39, 40.38 and 98.98 per cent. of moisture was separated in a 2½-inch Greenaway horizontal separator so completely that the percentages of moisture remaining in the steam as it left the separator were respectively 0.4, 0.7 and 0.35, or from one-third to two-thirds of 1 per cent. The temperature in the main ranged from 331 to 337.2 degrees F. at a pressure of from 99 to 106 pounds. The manufacturers state that this type of separator is being used successfully for separating moisture from compressed air.

The Greenaway Company has also secured the contract for a complete installation of separator appliances for the Cadillac Automobile Company, Detroit.

Recent Customs Rulings.

The Board of United States General Appraisers has overruled a protest filed by Strouse, Adler & Co., against the assessment of duty by the Collector of Customs at New Haven on importations of corset steel. The merchandise is in pieces about 100 feet long, 3 inches wide and less than 0.025 inch in thickness. The importers considered that the articles were properly dutiable at the specific rates provided for hoop, band or scroll steel. The board, however, in a decision written by General Appraiser Fischer, holds that the collector was correct in classifying the corset steel under the provision in the Dingley tariff law for sheet steel in strips at the rate of 45 per cent. ad valorem.

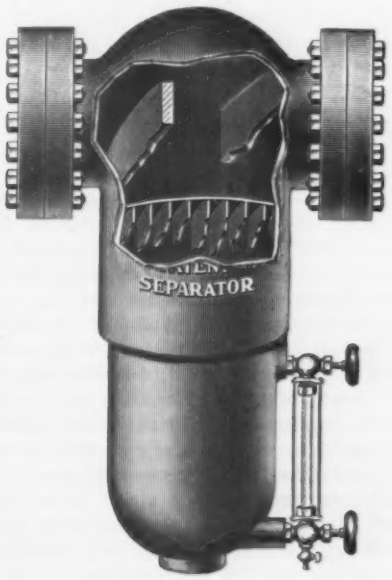


Fig. 2.—Broken View of a Type C Greenaway Separator, Smaller but of Similar Interior Construction.

In a decision by the Board of Appraisers, rendered July 29, the Surveyor of Customs at St. Louis was reversed in levying a 45 per cent. duty on steel tubes for holding gas imported by the Liquid Carbonic Company. It seems that the customs authorities deemed the tubes to fall within the tariff provision for "manufactures of metal." It was maintained by the importers that the articles were entitled to entry at the rate of 35 per cent. as "steel tubes." This claim the board sustains, and orders that a reliquidation of the entries be made on the basis found by the board.

Thomas Prosser & Son of New York have filed a protest with the Board of General Appraisers alleging that Collector Stranahan is in error in assessing duty at the rate of 45 per cent. on certain cement mixing machines imported by the protestants. It is claimed by the importers that the machines should be classified under the provision in the tariff law for "steel plates," with duty at specific rates. A hearing was held on the subject by the board last week, and after all the testimony is submitted the customs tribunal will formulate a decision. In order to permit the General Appraisers to study the machine at close range, one of the mixers was taken to the offices of the Customs Court at the Appraisers' Warehouse.

London *Engineering*, in an article on "A Home for Engineering Science," argues for the erection in London of a joint building for the various engineering societies of Great Britain. The same paper favored such a project about 20 years ago, but concerted action could not be secured.

Notes from Great Britain.

The Market.

LONDON, July 22, 1905.—The pig iron situation is somewhat of an enigma. The tendency again is to put iron into store on the Tees. No apparent reason exists for this movement, but it is a curious fact and creates uneasiness. The week before last nearly 12,000 tons went into store, the difference between makers' quotations and cash warrants being *nil*. It is rumored also that a considerable tonnage is accumulating in makers' yards and that consequently, notwithstanding that the bull syndicate is kindly holding about 500,000 tons off the market, makers find it impossible to get rid of their output. The position is serious, for it means either a drastic reduction in the make of Cleveland iron or a substantial fall in price to enable ironmasters to recover some of the markets lost to them by the artificial boom in April and May. The fresh accumulation of warrants will make it very difficult for the holders of the present stock to maintain their position, and some decided action on their part may become necessary before many weeks have passed.

In the Midlands there is a fairly steady demand for good merchant bars, and the makers of these are doing well, but the commoner qualities are in poor request at about £5 12s. 6d. There is also a good demand for gas strip, although the trade is now disturbed by internal competition. The sheet section is the most flourishing of all, however. Galvanizers have much work on hand and in some cases sales are being made at a substantial premium on the association standard. In addition prices are being talked up in anticipation of the meeting of the association next week, when it is said an advance is most probable. Black sheet makers, too, are working under considerable pressure, and in their case difficulties are being increased by a temporary scarcity of steel sheet bars. Breakdowns have occurred at two of the large steel producing works, and a strike is interfering with the output of another. As a consequence some makers are finding considerable difficulty in maintaining regular work.

German competition at the present moment excites no special attention, although a fair amount is coming in, and the same remark applies to American. American iron and steel are showing such an advance on former contracts that there is considerable difficulty in inducing customers to buy. There is a strong demand for structural and wagon sections, and works engaged in rolling this material are exceptionally busy.

Labor Difficulties Looming Up.

On all sides there are indications of dissatisfaction in the ranks of labor. In the cotton industry, upon which British prosperity so largely depends, masters and men are at a deadlock, and at the moment no one can foretell the result. A thousand men are affected in Middlesbrough, and on Thursday last the Blast Furnace Owners' Association held a meeting to consider an application from the Blast Furnacemen's Union for the establishment of an independent sliding scale for the regulation of wages. For some years wages have risen and fallen with and to the same extent as those of puddlers, but the men desire the introduction of a sliding scale based on the selling price of pig iron, as in the case of the North of England. The request will be a difficult one to comply with, it is said, and further consideration will be required before any decision is reached. There was also talk of impending difficulty with the men at one of the Northamptonshire furnaces. In connection with the Iron and Steel Wages Board a list of firms whose prices shall be taken has been agreed upon, and the accountants will get out the figures experimentally and as a guide to the fixing of the basis of the new sliding scale. Taking a broad view of these various labor movements, it would seem as if there is no marked intention on the part of the men for any substantial increase in wages, but there is, I think, a general feeling that the time has come for considerable modifications which the men deem necessary to adapt themselves to new developments.

The Supply of Wolfram.

It is interesting to note from time to time the mineral wealth of the British Empire as a whole. Thus in the high grade tool steels, while the tungsten, which is in so general use in these hardened alloys of steel, is largely imported from Prussia, there is an increasing production of the ore, known as wolfram, from North Queensland. The Australian mines are now one of the principal sources of the world's supply of the mineral. Last year's output was 1539 tons, value £161,635, or just under a shilling per pound. The selling price of metallic tungsten in Sheffield to-day is about 2 shillings 3 pence per pound, but it is and will be subject to wide fluctuations until the world's resources have been more fully exploited and something like an equilibrium has been established in the demand. The actual export of wolfram ore from Queensland during 1904 was under £100,000 worth, which suggests that speculation is already rife in this branch of the metal trade.

The Ingersoll-Sergeant Combine.

M. P. Grace, presiding this week at a meeting in London of the Ingersoll-Sergeant Drill Company, said that for two or three years past the question of the amalgamation of the company with other corporations had been discussed, and when Mr. Saunders, the president of the American company, was in this country last October he had laid down that he would only discuss amalgamation on three conditions: that they should retain the management, that they would not join any company whose capital was largely inflated, and so far as he was concerned he would not agree to any new capital being represented by bonds or stocks which had not their equivalent in actual assets. Negotiations had been completed with W. R. Grace & Co. of New York for amalgamation with the Rand Drill Company, and the Ingersoll-Rand Company had been incorporated in New Jersey for that purpose, the capital of the new company being $9,500,000. The English shareholders would be looked after by the present board, who would act as agents in London for the new American company. The agreement for the proposed amalgamation was unanimously adopted.

Profits and Dividends.

Vickers, Sons & Maxim have declared an interim dividend for the half year ended June 30, of 2½ per cent., less income tax on the preferred 5 per cent. stock and 5 per cent. preference shares, and 1 shilling per share free of income tax on the £3,689,500 ordinary shares of £1 each.

John Brown & Co. pay a dividend of 8 1-3 per cent., although the profits warrant a larger distribution, but the policy of this concern is to maintain a regular dividend as far as possible. At the annual meeting of the shareholders of this concern the chairman formally announced that arrangements had been made to purchase half of the gun works at present belonging to Cammell, Laird & Co. Sir Charles McLaren, speaking at this meeting, said that an American had told him some years ago that all the steel works in Sheffield were so many scrap heaps. Sir Charles remarked that this might be right or wrong, but he was quite certain that the Atlas and Clydebank Works could not be called scrap heaps to-day. These works were being maintained by a large annual expenditure entirely out of the gross revenue of the concern, and without any call on the shareholders for any increase of capital. There was an enormous improvement in the value and efficiency of their plant to-day as compared with ten years ago, and yet the total value of their assets taken into account was less by £15,000 in 1905 than in 1903, and only a very little more than in 1904, and at the same time the stock of work in progress had been reckoned in at a very much lower figure than last year, notwithstanding the vast amount of work on hand at Clydebank. That showed that they took a most economical and businesslike view of their financial situation and gave confidence to the shareholders that a good year would not be followed by a bad one. As regarded shipbuilding John Brown & Co. had taken a very advanced lead in this country in the construction of large turbines for marine propulsion. The turbine was invented by Mr. Parsons, and it was taken up on the Clyde

by William Denny & Brothers, who had built a number of small vessels with that form of engine; but it was developed by Mr. Dunlap at Clydebank on a larger scale and they were now to a certain extent reaping the reward of that enterprise, and the Government had been induced to sanction the construction of the enormous vessels that had been mentioned with turbine machinery for driving, instead of the usual reciprocating engines, and in the case of the largest vessel mentioned no less than 60,000 horse-power was to be developed. He was in hopes now that the Government having decided to lay down the Dreadnought, which was the newest and biggest of the battle ships, with turbine propulsion, these engines would be largely adopted in the navy, and that the position the firm had acquired in the engineering world in connection with turbine machinery would give them a very considerable chance of getting the best orders not only from the British Government, but from Russia and Japan.

The annual report of Furniss, Withy & Co., the large shipowners and shipbuilders, of West Hartlepool, has been issued. It states that notwithstanding the general depression in most of the industries in which the company is interested the profits of the year (including the balance of £51,394 brought forward from 1904) amount to £271,087. Directors' fees, income tax, interest on debentures, dividend on preference shares, and the dividends at the rate of 5 per cent. per annum, free of income tax, on the ordinary shares, reduces the amount to £171,642. The directors recommend that a sum of £50,000 be provided for depreciation, £25,259 for insurance and repairs, the payment of a bonus of 5 per cent. per annum (making 10 per cent. for the year, free of income tax), and that the balance, £36,382, be carried forward to next account. During the year several of the company's fleet have been thoroughly overhauled, the steamship lines have been well employed at freights below the normal rates, the shipbuilding yard again shows a large tonnage completed—27,392 tons—and the dry and ship repairing departments continue well employed.

Locomotives for India.

The North-Western State Railway of India has got Government approval to order 125 locomotives, 50 third-class bogie carriages and 1600 wagons, and the orders will, as usual, pass through the India Office. This is in addition to 176 engines and 2000 wagons now under order and to be delivered by the end of next year. This large addition to rolling stock for the largest of the State worked railways of India—the rail mileage being 3951 miles—has been necessitated by the great development of traffic in recent years. Since 1900 the goods tonnage has increased 23 per cent. and the haul per ton has gone up from 131 to 302 tons, which alone establishes the need for the new rolling stock, a large part of which ought to be ordered from the Scotch builders.

Developments in Italy.

The industrial development of Italy is apparently continuing at a rapid rate, one of the noteworthy features of the movement being the conversion of private enterprises into joint stock undertakings to carry on the business on a much more extensive scale. In Milan, under the auspices of the Credito Italiano, a company with the title of the Valdarno Mineral & Electrical Company (Societa Mineraria ed Elettrica del Valdarno) is being formed, with a capital equivalent to £160,000, to take up the extensive lignite mines of the Ferriere Italiane for more intensive working and the conversion of the fuel obtained into electric power and light for the industrial centers of Tuscany. Out of the firms of Giovanni Knusli & Co. and the Filatura di Cotone di Carru the Manifattura di Carru, a company with a capital equivalent to £80,000, and powers of increase to £120,000, is being formed to run cotton spinning and weaving mills; and two cotton waste spinning mills formerly owned by Messrs. Fabris are to be the basis of the business of the Societa Anonima Cascami Fabris, which begins with a share capital equivalent to £40,000. In Genoa one of the largest color manufacturing firms of Italy, that of Armanino Brothers, is to be converted into a joint stock company, with a capital equivalent to £120,000. A chemical manufacturing company of Rome, the Societa Prodotti Chimici, is to increase its capital from the equivalent of £140,000 to that of £200,000; and an electrical engineering company of Milan, the Societa Anonima Brioschi e Finzi, is increasing its share capital from the equivalent of £100,000 to that of £200,000. S. G. H.

Consolidation of Street Car Manufactuers.—A consolidation of the 15 leading street car manufacturers of the United States has been effected. The organization also includes manufacturers of street car appliances. The company is capitalized at $54,000,000, consisting of $11,000,000 of 5 per cent. bonds, $15,500,000 of preferred stock and $27,500,000 of common stock. The companies included in the consolidation are as follows: J. G. Brill Company, Philadelphia; Kuhlman Car Company, Cleveland; Laclede Car Company, St. Louis; St. Louis Malleable Casting Company, St. Louis; St. Louis Car Company, St. Louis; Cincinnati Car Company, Cincinnati; Wason Mfg. Company, Springfield, Mass.; Osgood Bradley & Sons, Worcester, Mass.; McGuire-Cummings Mfg. Company, Chicago; Cummings Mfg. Company, Paris, Ill.; Jewett Car Company, Newark, Ohio; J. M. Jones' Sons, Troy, N. Y.; Laconia Car Company, Laconia, N. H.; Peckham Mfg. Company, Kingston, N. Y.; Niles Car Mfg. Company, Niles, Ohio. The name of the new company has not yet been selected.

Office employees of the Allis-Chalmers Company, at Milwaukee, have organized a Luncheon Club and rented as a club house the old Rugee homestead, at the corner of Hanover and South Pierce streets, very near to the Clinton street shops of the company. The aim of the club is to solve the question of getting quick meals at noon. The majority of the employees and officers prefer a short noon hour and early closing of the offices at night, and the maintaining of the club will enable them to get their noon meal in short time and without the necessity of going uptown. The membership is confined to employees of the company and will reach between 300 and 400. A reading room will be established in connection with the restaurant. A House Committee has been appointed, consisting of David Harlow, traffic manager, as chairman; Jas. A. Milne, comptroller; Theodore J. Illing, Hager, Dodge, Prince and Schiffling. The club was formally opened with a house warming on Tuesday, August 1.

There is a possibility that a public heating plant will be erected in Milwaukee, dependent at the present time on the granting of a franchise to the Central Heating Company of Detroit, Mich. The franchise has been under consideration by the Common Council of Milwaukee for some months, and at a joint meeting of the committees on Public Buildings and Judiciary, held July 27, after making several amendments to the original ordinance it was finally recommended for passage by the Council by a vote of nine to one. If the franchise is secured the company will erect a central heating plant and furnish steam heating for business blocks as well as for private houses. One amendment passed by the Joint Committee, which was opposed by the promoter of the company, provides that the city reserve the right to regulate the prices charged for heating if the franchise is granted.

The strike of workmen on the Blackwell's Island Bridge, now under construction by the Pennsylvania Steel Company, is over and about 6000 tons of material is on the ground for the span over Blackwell's Island and the two adjoining half spans, one over the easterly half of the Manhattan channel and the other over the westerly half of the Long Island channel. These three go up together. Four of the heavy steel castings which are the legs of the steel towers and which weigh over 50 tons each are now on the island and the remaining four are in transit.

THE IRON AGE

1855—1905.

New York, Thursday, August 3, 1905.

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHER
CHARLES KIRCHHOFF, - - - - - - - - } EDITORS
GEO. W. COPE, - - - - - - - - - }
A. I. FINDLEY, - - - - - - - - }
RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR

Our Dominating Position in Copper.

The enormous growth in the exports of copper from this country is attracting world-wide attention, coupled as they are with an evidently considerable increase in our home consumption. There is one feature in connection with the copper industry of recent years which, we take it, is not as thoroughly and as generally understood in the metal trade, and that is that as producers the United States, Canada and Mexico are virtually one. Practically all the Canadian copper and a very large part of the Mexican product are refined and marketed in this country, and a considerable share of our exports is really Mexican or Canadian metal in transit for the world's markets.

As an offset against our exports we must therefore place the imports of foreign copper, which comes to us in the form of ores for smelting, matte for Bessemerizing and refining and converter bars for refining and for recovering the precious metals which accompany the copper.

The dependence of our neighbors upon our metallurgical works is striking. One of the large companies of the boundary district in British Columbia has its smelting plant across the line in Washington. The others ship for further treatment either their mattes or their converter bars to Puget Sound or Atlantic coast refineries. The greater part of the copper and nickel matte of the Sudbury district comes to this country for separating and refining. The metal from the Greene copper smelters, across the border in Sonora, and from the different smelting plants controlled by interests identified with the American Smelting & Refining Company is prepared for the market in this country, and the concentrates from the Nacozari mines controlled by Phelps, Dodge & Co. are worked at their smelter at Douglas in Arizona. The only really large Mexican producer which ships direct to Europe is the Boleo in Lower California.

Besides this metallurgical dependence upon us the copper interests of our neighbors are largely owned and controlled by our own capitalists, so that commercially the three countries have become practically a unit so far as copper is concerned.

On the whole, therefore, it would be more correct to present the statistics of our export movement of copper with a due allowance for the very important imports. In fact, the developments of the last year are even more startling when that is done. The figures just published by the Bureau of Statistics may serve to illustrate the point. Outside of ore, the copper contents of which we do not know, we exported during the two fiscal years ending June 30, 1905, and June 30, 1904, 591,362,271 pounds and 422,595,277 pounds of copper respectively and sent out also a small quantity of foreign copper.

Our imports were 175,238,869 pounds of copper during the fiscal year ending June 30, 1904, and 190,449,406 pounds during the fiscal year ending June 30, 1905. The fact may be mentioned incidentally that of these quantities 108,808,940 pounds in 1903-1904 and 124,743,986 pounds in 1904-1905 came from Mexico and 36,837,756 pounds in 1903-1904 and 35,443,266 pounds in 1904-1905 reached us from British North America. Therefore, what may be termed the net exports rose from 247,356,408 pounds in the fiscal year ending June 30, 1904, to 400,912,865 pounds in 1904-1905, an increase of 153,556,457 pounds in 12 months.

Such figures throw a flood of light on the tremendous development of the copper consumption of the world and explain the steady rise in values during the past year, in spite of the great expansion in the production which has been and is still taking place in this country and in Mexico.

The Problem of Workmen's Homes.

With the modern tendency to remove the large metal manufacturing establishment from the cities to a suburban neighborhood some distance from the former site, the manufacturer has to face the problem of keeping his old employees. He must either provide homes for them, if rentable houses are scarce, or else he must provide quick and cheap transportation to and from their homes in the city. In any case he will lose some of his men, for there are those who own their homes and do not care to give them up, nor do they like to travel a distance each day, which is frequently true with older men, whose habit it is to pass quickly from their homes to their work, including the noon hour for dinner. But the great majority of employees will follow the employer if he does not move his business to too great a distance and providing there is quick, cheap rapid transit and new homes to be occupied, for some men prefer the one alternative and some the other. When a large shop is relocated it is usually in a sparsely settled neighborhood, where very few tenements are obtainable at any price, and those that exist quickly go up in price. There may be electric street railways, which will carry the men to and from the city, but while this is a most desirable mode of travel, yet it takes time and means very early rising and a late arrival at home at night.

In the case of large establishments special trains have partly solved the problem, until the demand for houses has aroused the real estate owner to supply the need. It is surprising what comparatively small traffic will justify a railroad to operate a special train for employees and yet earn a profit from the reduced fares accorded to daily passengers. Such an instance is that of the colony of manufacturers at Barbers Crossing, Worcester, Mass., and at the B. F. Sturtevant Company, Hyde Park, Mass., where regularly twice a day a train carries the workmen between the works and the city. In both these instances, however, there is a sufficient number of tenements to satisfy the demands from the men. In other instances the train will accomplish the desired result alone. It is necessary to establish a shop village, and in the metal industry this is something rather new, though there have been isolated instances for years. To-day the idea is being carried out in many instances, owing to the necessity for making such provision for employees, else it is difficult to keep them, especially during such times as these, when the better class of labor is oftentimes difficult to obtain and men in suburban shops living in the city are glad to take work of other employers nearer home.

Manufacturing companies are building little villages. So are the railroads near their large repair shops. These are not like the textile villages, which have always existed. The quality of the workmen's homes must average better, because the workmen average a better class. To

be sure there must be the very cheap tenements for the day laborers and less skillful workmen. But there must be homes for men earning first-class wages, self respecting men, with families of careful, home loving wives and children, who require the best of surroundings. Once the shop village of this class is established it will grow without the aid of the shop. Workmen will build homes of their own, which is most desirable as bearing upon permanency of employment and its influence against labor agitation, for the home owning workman is less apt to be led astray by the professional agitator than the man whose industrial life is a transient one. The workman is better off living in these suburban homes. His children live healthier and better lives. The influence of the big suburban shop is far better than that of the city, provided that the shop village is started as it should be, with good buildings, some attempt at "village improvement" to stimulate a desire to have things look tidy and pretty, and with the effort to eliminate undesirable influences in the neighborhood. There is no need of ultra-æsthetic effort. But the shop corporation can build attractive homes and rent them at a reasonable price and still earn a profit on the actual investment, to say nothing of that other direct financial benefit which goes with the maintenance of a permanent force of trained workmen.

Metal Exports for the Fiscal Year 1905.

The fiscal year of the United States Government closes June 30. The passage of June therefore brings with it an attractive opportunity to consider the development of a full period of 12 months in the country's commerce. The report of the Bureau of Statistics of the Department of Commerce and Labor, which has just been issued for June, gives figures not only for the 12 months ending with that month, but also for the two previous corresponding periods. The comparisons thus capable of being made are exceedingly interesting at this time, in view of the great stride made in our exports of manufactures during the 12 months just closed.

The exports of manufactures during the fiscal year thus covered reached figures never before attained. Their value was $543,620,297, out of a grand total for all exports of $1,491,744,695. The value of the manufactures exported was thus 36.44 per cent. of the total. In the fiscal year 1904, the best previous year, the value of manufactures exported was $452,445,629, or only 31.52 per cent. of the total volume of exports. In the month of June the percentage of manufactures exported was 42.27 of the total exports, showing that the heavy gain in the outward movement of manufactures was being continued.

Very prominent in this feature of our foreign trade has been the exportation of iron and steel products, which, excluding ore, reached a total in the fiscal year 1905 of $134,727,921, against $111,948,586 in the fiscal year 1904, and $96,642,467 in 1903. The exports of copper also figured very conspicuously, amounting to $86,225,291, against $57,142,081 in 1904, and $39,667,196 in 1903. These two items show an enormous gain as compared with the previous two years, and taken together account for over 40 per cent. of the past year's outward movement in manufactured products.

Zinc, excluding ore, made a decided jump in the past 12 months, the figures showing a total value of $1,319,619, as compared with only $258,710 the previous fiscal year and $285,673 in 1903. The exports of lead showed only a moderate gain, amounting in the past year to $667,194, as compared with $538,020 for the previous year, and $452,702 in 1903. Manufactures of tin reached a total of $721,842, as compared with $731,553 in the previous year and $656,096 in 1903. Brass and its manufactures showed a handsome gain, the total value during the past year having been $3,025,764, against $2,557,484 the previous year, and $2,000,432 in 1903. A very heavy gain is observed in the exports of nickel, nickel oxide and matte, the figures for the year showing a total of $3,196,622, against $940,558 in the previous fiscal year, and $864,221 in 1903.

For some years a regular growth occurred in the exports of agricultural implements, but during the past year this movement was reversed. In 1905 the total exports of farm machinery reached the sum of $20,721,741, as compared with $22,749,635 in 1904, and $21,006,622 in 1903. The sale abroad of carriages, cars and other vehicles also declined. The total value of exports of such commodities during the past fiscal year was $10,610,437, as compared with $10,936,618 in the previous fiscal year, and $10,499,195 in 1903.

We had also for some time made much headway in cultivating a foreign trade in electrical appliances, but the past year this movement seems to have reached its culmination, as the total value of such exports in the past fiscal year was $4,962,972, as compared with $4,861,204 in 1904. The same remark applies with still more force to the exports of other instruments and apparatus for scientific purposes, of which the value of exports in the past fiscal year was $3,210,008, as compared with $3,436,519 the previous year and $2,923,891 in 1903.

It is worthy of note in this connection that the exports during the past year showed a decrease to European countries and a gain with all other divisions of the world, except Africa. The increase in our export trade was particularly heavy with Asiatic countries, this trade having more than doubled. The North American countries were also much more liberal purchasers of our commodities, while South America made only a moderate gain as compared with the preceding year. Oceania simply increased its trade sufficiently to show a comparison on the right side. Evidently if the Orient and our immediate neighbors on this continent had not been such good customers of ours the trade showing for the past 12 months would not have been so favorable.

The National Association of Automobile Manufacturers is actively working for the abolition of the tax on denaturized alcohol. A bill to this effect will be introduced at the next session of Congress. S. A. Miles, general manager of the association, in a letter just issued, says: "This proposed legislation is of special interest to the manufacturers of motor vehicles, power boats and launches and stationary interior combustion engines, as its enactment would permit the use of alcohol for many purposes for which gasoline is now used. The price of gasoline has largely advanced during the past six or seven years and it is highly desirable that an alternative motor fuel should be secured. The supply of alcohol is, of course, unlimited, as it can be readily distilled from corn, potatoes and other farm products. In addition to their interest as the producers of the materials from which alcohol is distilled, the farmers would also be greatly benefited through the possible use of alcohol as a motor fuel for running all kinds of farm machinery, pumping, &c."

The generating plant of the Metropolitan Railway at Neasden, London, contains four 3500-kw. three-phase turbo-generators supplied with steam by Babcock & Wilcox boilers equipped with Roney automatic stokers. The turbines are operated condensing by means of barometric ejector condensers, the cold circulating water being forced to the top of the condensers by centrifugal pumps. The condensed steam and circulating water are then delivered to cooling towers, from which it passes into a cooling reservoir with a large exposed surface.

CORRESPONDENCE.

Chain Making by Electric Welding.

To the Editor: The writer notes with interest the criticisms made on my article on "Chain Making by Electric Welding," by W. S. Gorton of the Standard Welding Company, of Cleveland, Ohio, and while I do not wish to open up any controversy with such an eminent authority on electric welding as Mr. Gorton, yet I feel called upon to venture a few remarks in return.

In the first place, Mr. Gorton quotes me incorrectly when he states that I claim "that there is no loss in electric energy when welding a chain link by electricity, as the current for the heating passes only across the joint." By reference to the text of my article it will be found to read as follows: The moment the two ends touch the current crosses and the resistance of the metal at the point of contact produces the heat necessary in welding. There is no waste heat, as the heating does not commence until the ends are in contact, and when the weld is made the current is cut off." It was the farthest from my thoughts to make any such statement that the current passes only across the joint, as it is well known that a portion of the current passes around the link. What I claim is that the passing of the current across the joint produces the welding heat. I also state that there is no waste heat, meaning that the heat is not continuous, like that in a gas forge, but is produced just when needed. Reference to the text will show that in making chain on a gas forge the interior of the forge is constantly at a very high temperature so that the links can be very quickly brought to a welding heat.

In regard to the statement that I am incorrect when I state that the Giraud electric chain welding machine operates best when nonautomatic, I can only say that this is the opinion of M. Giraud himself, the inventor of the process and a gentleman who has made chain by this process for a great many years. I am of the opinion that M. Giraud ought to know which of his own machines works best.

As to the "evident error" made by the writer in placing the cost of 9-32-inch gas welded coil chain at $4.50 per 100 pounds, I challenge Mr. Gorton to produce the statement of any chain manufacturer in the United States who can make 9-32-inch coil chain at any lower price than $4.50 per 100 pounds, when figuring $36 per gross ton for rods and paying the union scale price for welding; 9-32-inch coil chain cannot be bought for less than $4.50 per 100 pounds, as the wholesale market price to-day is about $5 per 100 pounds, Pittsburgh, and it is quoted to-day in *The Iron Age* at $5.35 per 100 pounds. Of course it can be sold at less than $4.50 per 100 pounds and as low as desired, but it cannot be sold at less than $4.50 per 100 pounds to have the manufacturer make any profit. It is of course hardly possible that any chain manufacturer is going to come out with a statement of how much his product costs him, but the tables of costs used in my article were based on information supplied to me from one of the largest chain manufacturers in the United States, whose product is known from ocean to ocean and whose name is synonymous with high quality and low prices.

CHAIN MAKER.

The Adams-Farwell motor car has a novel feature in a three-cylinder horizontal air cooled engine of 20 horsepower, in which the cylinders are placed 120 degrees apart and have a common crank chamber. The crank, which is vertical, is fixed and the cylinders and crank case, weighing together 190 pounds, rotate about it, the power being transmitted from a bevel pinion on the rotating crank chamber. The cylinders have a diameter of 5 inches and a stroke of 4½ inches. There is but a single crank, the three pistons being connected to a single wrist pin by means of bronze connecting rods. The pistons thus reciprocate back and forth in the cylinders, but as no necessity obtains for the moving, starting and stopping of the mass of the pistons at each stroke, it is claimed that perfect balance is obtained.

The American Boiler Manufacturers' Association.

In our last issue a report was presented of the proceedings of the first day of the seventeenth annual convention of the American Boiler Manufacturers' Association at Toronto, Canada.

The report of the Committee on Uniform Boiler Inspection was the principal matter before the convention on the second day, Wednesday, July 26. It was presented by Col. E. D. Meier of New York, president of the Heine Safety Boiler Company. The report referred at the outset to the failure of the last Congress to pass either the bill introduced by the committee or the one introduced by Secretary Cortelyou of the Department of Commerce and Labor. The meeting of the representatives of the boiler manufacturers with Secretary Metcalf at Washington on January 16, 1905, was gone into in detail. The delegation was composed of H. J. Hartley, Thomas Rees and Colonel Meier, who explained to Secretary Metcalf the differences in results of tests as made on the old 1-inch section and those made with the present 9-inch section. They showed that Traill's rules, which were made for iron plate and iron rivets, gave incorrect results for steel plate and steel rivets. They urged that the requirements should be so changed that all modern riveted seams—viz., double riveted lap, triple riveted lap, single butt strap and double butt strap—should all be given their due value. The committee pointed out the injustice of allowing 0.08 per cent. phosphorus in plates made by the acid process, while limiting those made by the basic process to 0.04. It was urged that the latter content be fixed for both kinds of plate; also that the percentage of sulphur should be fixed so as to prevent the use of red short steel.

A protest was made also against exempting iron tubes from the very careful tests prescribed for steel tubes, as being contrary to the practice of well-known inspection bureaus. It was pointed out that in the last ten years steel tubes have improved in quality and that iron tubes have deteriorated, the statement being made that some so-called charcoal iron tubes are not made of charcoal iron, but of scrap, whose constituents it is practically impossible to determine. Another matter urged by the committee on its visit to Washington was an amendment to the law making the thorough inspection and acceptance of a boiler at the point of manufacture conclusive and binding for the same boiler at any point where it might be installed in a vessel. The committee felt convinced that the Department of Commerce and Labor was determined to make all improvements in the laws, in the rules and regulations governing the steamboat inspection service, also in methods of administration, which can be shown of value in bettering the service.

Reference was made in the report also to the bill which had been prepared providing for a commission on marine construction, to be composed of five members appointed by the President, by and with the consent of the Senate. It was the opinion of the committee that this commission should consist of a naval architect, an engineer experienced in marine engines and boilers, a manufacturer of steel plates, a practical boiler maker and a seaman. Colonel Meier had written to Herbert Knox Smith, assistant commissioner, to whom Secretary Metcalf had delegated the work relating to the proposed revision, and suggested the above composition of the commission. The reply of Mr. Smith was that a broad construction would be put on the provision in the bill as to the *personnel*, but that at the time there was no chance of the bill passing the House.

Another suggestion which the committee had forwarded to Commissioner Smith was that supervising inspectors must criticise and either correct or approve the drawings and specifications for marine boilers, and when boilers are subsequently built according to such drawings and specifications they must be accepted anywhere in the United States; further, that when an inspector condemns any part of a boiler he should specify exactly the repairs to be made.

Referring to the circular issued by Secretary Metcalf on March 21, 1905, giving sections of the revised statutes

relating to steamboat inspection service, amended by Congress March 3, 1905, and effective July 1, 1905, covering 20 sections, the committee asked that all members of the association especially interested in marine boilers compare these carefully with former sections and point out to the committee any undesirable provisions contained therein. Particular attention was called to the amendment to section 4405, giving the Secretary of Commerce and Labor power to call a meeting of an Executive Committee at any time during the year, this committee, with the approval of the Secretary, to have power to amend or repeal any of the rules and regulations. Attention was further called to the circular of the Department of Commerce and Labor issued July 10, 1905, giving some 40 amendments to the rules. [A synopsis of these amendments was given in *The Iron Age* of July 27, 1905, page 218.—ED.]

Referring to conferences had between representatives of the Association of American Steel Manufacturers and the American Boiler Manufacturers' Association, the committee said that it has been impossible to come to an agreement as to the steel specifications, particularly the matter of chemical properties. Secretary Albert Ladd Colby, of the committee of manufacturers, had written Colonel Meier on July 19, 1905, giving reasons why the Association of American Steel Manufacturers could not agree to lower the sulphur and phosphorus limits.

In conclusion the report emphasized the necessity of a complete revision of the steamboat inspection laws by an expert commission acting on the general lines contained in the bills offered by the American Boiler Manufacturers' Association, which had been introduced in Congress. It was considered entirely feasible for a committee of the boiler manufacturers or a subcommittee to agree with the Department of Commerce and Labor on the exact form of such a bill, which should also have the support of the steel manufacturers and the American Society for Testing Materials.

The day was spent largely in the discussion of this report, and for a portion of the time the deliberations were conducted in executive session.

Following is a list of the officers elected for the ensuing year: President, R. Monroe, Jr., George Monroe & Son, Pittsburgh, Pa.; secretary, J. D. Farasey, H. E. Teachout Boiler Works, Cleveland, Ohio; treasurer, Joseph F. Wangler, J. F. Wangler Boiler Works, St. Louis, Mo.; first vice-president, M. F. Cole, R. D. Cole Mfg. Company, Newnan, Ga.; second vice-president, John J. Main, Canadian Heine Boiler Company, Toronto, Canada; third vice-president, John Rourke, Rourke & Sons, Savannah, Ga.; fourth vice-president, J. Don. Smith, Valk & Murdock Iron Works, Charleston, S. C.; fifth vice-president, George H. Kittoe, Aurora Boiler Works, Aurora, Ill.

The next convention will be held at Pittsburgh, Pa., on a date which will be announced by the proper committee.

The American Foundrymen's League.—This organization holds its annual meeting on Thursday of the current week at Niagara Falls, N. Y. It is composed of foundrymen who are operating open or nonunion foundries. It maintains a free labor bureau for the general benefit of its members and nonunion molders. The present officers are as follows: President, E. C. Stearns, E. C. Stearns & Co., Syracuse, N. Y.; vice-president, Edward Gurney, Gurney Foundry Company, Toronto, Canada; treasurer, J. B. Jones, Utica Heater Company, Utica, N. Y.; secretary, William Sleicher, West Side Foundry Company, Troy, N. Y. The league has issued a list of open and nonunion foundries. It is quite surprising to know that so many open and nonunion foundries are being operated in this country as shown by the list, which is quite extensive. The statement is made by President Stearns that the list is not complete and additional names will be welcomed. A revision of the list will be published from time to time containing the new names.

The Standard Tin Plate Company, Canonsburg, Pa., manufactures a wide variety of black plates and tin plates. The black plates comprise enameling stock, ceiling stock, stove pipe stock, tack plate and music disk stock. The tin plates cover cokes, extra cokes, best cokes, charcoal, terne roofing and strips. Special attention is given to finishes specified and to coating, cleaning and assorting.

Pacific Coast Trade News.

SAN FRANCISCO, CAL., July 22, 1905.—The 12th of July has come and gone and still the Pacific Mail Company keeps the field, at least so far as San Francisco is concerned. There has been some disarrangement in the schedule of its steamers—for instance, two going out the same week and two arriving the same week—but otherwise matters will go on as they have been doing. The battle now will be for the foreign trade that passes over the Isthmus, but in this the Coast cities are only remotely interested. It consists principally of merchandise from Europe and the Eastern States to South American coasts on the Pacific and the Central American coffee crop or that portion of it which finds a market in Europe and the East. The freight between New York and other seaboard Atlantic cities must necessarily be carried in the steamers of the Pacific Mail or those of some other American company, and as there is not enough freight to support two companies the old one must necessarily keep the field.

The way in which the matter has been left open does not at all meet with the approbation of those of our merchants who are engaged in importing Eastern merchandise. A leading merchant in the hardware line and an old Californian, expressed himself to the writer that nothing could be served by the present arrangement, or rather lack of arrangement, except to furnish an occasional cargo for some tramp steamer of American nationality. This he considered a serious evil, as it will disturb and disarrange all the leading sections of trade. It would for a while and in particular cases reduce freight on some articles and necessarily reduce somewhat the prices in San Francisco and other Coast markets. After a while, however, the tramp steamer would seek fresh fields and pastures new and leave the field to those of the regular line, which in order to pay expenses would be obliged to put up freights to where they were before. But in the case of merchandise the return to normal conditions would not be so easy. In fact, it might be said to be practically impossible to raise prices when they had been reduced. Thus the merchants would be deprived of their legitimate profit or be obliged to do business on such a light margin that it would be next to nothing. He said further that conditions in the trade were bad enough as they were, without bringing this additional trouble on the heads of the merchants. There was so much competition that there was little profit. Between competition on the one hand and the advance of freight on the other the merchant and manufacturer were obliged to see the cost of production and the selling price approach each other gradually until there was nothing left.

The labor battle is being fought out in San Francisco at present. Ostensibly it is a fight on the part of the job printer for the eight-hour day, but it is generally understood that the struggle is one between unionism and the Citizens' Alliance. If so, the latter is getting the worst of it, as it has been agreed to give pressmen the eight-hour day, and necessarily the hours will have to be those of the printer, too.

For the month of June the contracts recorded for buildings in the city and county of San Francisco equaled $2,376,928, and for the six months of 1905, $11,463,076, the latter being about $3,000,000 over the figures of last year. J. O. L.

A terminal and warehouse plant for the freight transportation system of the Illinois Tunnel Company of Chicago is to be established at the northeast corner of Taylor and Beach streets, west of the Chicago River, with a frontage of 400 feet on the river and 700 feet on Taylor street. On the property are warehouses from six to ten stories in hight, which will be used for the storage of freight for the smaller concerns which have no warehouses of their own.

Trade Publications.

Water Power Equipment.—Wellman-Seaver-Morgan Company, Cleveland, Ohio. Illustrated catalogue; size, 6 x 9 inches; pages, 24. The apparatus described and shown is adapted for heads up to 100 feet, the turbines being of the Jolly-McCormick pattern, which are furnished in a variety of settings and combinations depending upon the local conditions, such as head, speed of flow, power required, contour of ground, &c. Descriptions and illustrations are given of standard vertical cylinder gate wheels, balance gates, standard runners, standard horizontal single turbine, special horizontal unified turbine, direct connected turbine exciter units and special penstock unit, built for the Michigan Lake Superior Power Company, Sault Ste. Marie, Mich. The last few pages of the catalogue contain power tables of standard turbines, list of parts of standard vertical cylinder gate wheels, a test record of a pair of special turbines and data for making estimates on turbine installation.

Railway Generators.—Crocker-Wheeler Company, Ampere, N. J. Bulletin 52 (superseding No. 26). Contains description and half-tone views of railway generators and their parts in detail. These are built in capacities of from 150 to 1500 kw. A number of installations are illustrated.

Automobiles.—Association of Licensed Automobile Manufacturers, 7 East Forty-second street, New York City. Handbook of gasoline automobiles for the information of the public who are interested in their manufacture and use. Size, 5¼ x 7¼ inches; pages, 122. Contains prices, illustrations and specifications of latest models manufactured by the companies which are members of the association, including the Apperson, Autocar, Berg, Buick, Cadillac, Clement-Bayard, Crestmobile, Columbia, Courier, Darracq, Decauville, Elmore, Franklin, Fiat, Great Arrow, Haynes, Locomobile, Mercedes, Northern, Orient, Oldsmobile, Packard, Panhard, Peerless, Pierce Stanhope, Pope-Hartford, Pope-Turbine, Pope-Toledo, Renault, Rochet-Schneider, Stevens-Duryea, Smith & Mabley, Simplex, Stearns, Studebaker, Standard, Thomas Flyer, Winton and Yale.

Sensitive Drill Presses. William Gardam & Son, 45-51 Rose street, New York City. Loose leaf catalogue; size, 4¼ x 8 inches. Contains prices, illustrations and brief descriptions of Nos. 2, 3, 4, 5, 6, 10, 11, 12, 13 and 14 sensitive bench drills and drill presses ranging in size from 10 to 14 inches, and a patent adjustable multiple spindle drill. Pamphlet accompanying this catalogue gives illustration and brief description of Gardam's sensitive bench drill press No. 1, for the special use of jewelers, opticians and electricians. Mention was made of this drill in *The Iron Age* of June 8, 1905.

Cranes.—Pawling & Harnischfeger, Milwaukee, Wis. Seventh edition, 1905, general catalogue. Size, 9 x 12 inches; pages, 139. Beginning with the electric motors the parts upon which the merits of the complete machines depend are treated in a complete detailed description. These parts include load brakes, bridge drive and hoist motor brakes, cages and controllers, bottom blocks, runways, bridge trucks, journals and bearings, gears and wire rope. Succeeding pages deal with standard and special types of trolleys and cranes, illustrated with a large number of full page half-tones, many of which show notable installations. This part of the book is mostly in the nature of an album with brief captions giving the most important facts. The standard sizes of cranes range in capacity from 5 to 150 tons, each size being furnished in two or three hoisting speeds and one or two traveling speeds of bridge and trolley. Besides the large line of standard cranes this company also designs and constructs many of special character for handling material in locations where a crane of the usual type would not be effective. A portion of the catalogue contains a list of crane users and the latter part deals with traveling electric hoists and their accessories and hand operated appliances.

Gas Producers.—The Morgan Construction Company, Worcester, Mass., has prepared a pamphlet 6 x 9 inches, 50 pages, on the Morgan continuous gas producer. It is well illustrated, the views including installations at important steel plants. At the Illinois Steel Company's South Chicago works are 74 producers of this type; at the Lackawanna Steel Company's works, South Buffalo, 52 producers in four batteries. The features of the producer and the economies obtainable through securing a high heating value of the fuel are explained with considerable detail. An average efficiency of 92 per cent. is shown in tests made by Robert W. Hunt Company at the works of the Grand Crossing Tack Company, Grand Crossing, Ill. Emphasis is put upon the George automatic feed and the good distribution of the coal, as demonstrated in a number of tests. One of these was made in Germany.

Large Steam Engines.—Quincy Engine Works, Quincy, Ill. Two bulletins. No. 103 contains half-tones and brief description of three styles of vertical automatic engines: Style A, arranged for mounting generator between the frames; style B, for mounting generators at both ends, and style C, for mounting at one end only. Made in capacities of 100 to 1800 horse-power. Bulletin No. 104 pertains to heavy duty Corliss engines of a recently redesigned pattern adapted to higher pressures and speeds than heretofore common. It is built in simple and compound form in capacities of from 32 to 3400 horse-power.

Roll Crushers.—Sturtevant Mill Company, Boston, Mass. Folder. Gives a general view of the Sturtevant balanced rolls crusher; section drawing; detail of the roll bearings, and a view with the case and hopper removed. Describes the machine and its qualifications for crushing rock economically, and gives as a definition of balanced rolls those in which the shock movements in crushing are made in opposite directions at the same time and with equal force, so that they exactly counteract and offset each other.

Flexible Pipe Joint.—Moran Flexible Joint Company, Louisville, Ky. Pamphlet; size, 4½ x 10½ inches; 31 pages. Frontispiece shows a 24-inch Moran flexible joint, guaranteed to be absolutely tight and flexible under any pressure. Gives a few illustrations of the numerous uses to which the joint is adapted in steam, air, gas or liquid systems, under any pressures or conditions. Among the applications shown are the use of the joints in loading and unloading tank wagons, cars and vessels; in setting up steam or air machinery for testing; in supplying pneumatic tools; in dredging, &c. A number of testimonial letters are appended.

Trucks.—Spicer Mfg. Company, New Philadelphia, Ohio. Pamphlet. Shows a number of factory trucks for the handling of materials such as tin plate, sheet lead, sheet iron, steel, &c. also gives brief specifications of standard and bench type emery grinders.

Air Compressors.—Chicago Pneumatic Tool Company, 1010 Fisher Building, Chicago, Ill. Catalogue. Covers new pattern, type G, Franklin compressors. In the steam driven form these are arranged with duplex, compound or single steam cylinders, air cylinders being compound in the first two cases. In the belt driven form they are made with compound, duplex or single air cylinders. Description is given of details including the discharge and inlet air valves, a section of the air cylinder, &c. The last few pages give tables of dimensions of receivers.

Forming Machines.—Manville Brothers Company, Waterbury, Conn. Supplement to catalogue A. Gives dimensions of two new sizes of automatic wire and metal forming machines, Nos. 34 and 40, capable of handling soft steel wire up to 0.25 and 0.31 inch in diameter, respectively.

Switches and Starters.—Cutler-Hammer Mfg. Company, Milwaukee, Wis. Bulletins. No. 24 gives dimensions of compound starting and regulating rheostats; No. 52, views and prices of self starters with reversing switches for freight elevators, dumb waiters, &c., and connection diagrams; No. 72, dimensions of drum type reversing switch for electric elevators and connection diagrams.

Roofing and Roof Mending Materials.—Philip Carey Mfg. Company, Lockland, Cincinnati, Ohio. Folding mailing card. Concerns Carey Stop-a-Leke Styck for mending leaks in all kinds of roofings or around skylights, or in boats, tanks, &c. Also refers to Carey's universal roof coating and Carey's roofing.

Steam Heating.—Warren Webster & Co., Camden, N. J. Part V of general catalogue. Concerns the Webster system of steam circulation for heating purposes. This is a new edition of the Part V previously issued and aims to give in the clearest and least technical manner the possibilities of steam circulation without pressure. It gives a large number of photographs of notable buildings in which installations of this system have been made, their diversified character showing the wide range of problems dealt with.

Pneumatic Tools.—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York City. Bulletin 2002. Contains an abstract from the *Engineering Record* concerning the track laying on the Williamsburg Bridge, New York City, and gives interesting statements of the items of cost of the bridge and the quantities of material entering into it. The steel alone amounted to 50,000 tons. The illustrations show pneumatic drills in use for boring rails for bonding and boring ties and guide rails.

Metal Preservatives.—Hydro-Carbon Mfg. Company, Denver, Col. Catalogue. Size, 8 x 10½ inches; pages, 31. Describes elateroid coatings for preserving metal from the action of extreme temperatures, moisture, gases and other destructive agents. Photographic views are given of many applications of the elateroid preservatives and testimonials from users. Five varieties of coatings are made, one with heat resisting qualities for boiler fronts, glass, &c., one for preventing rust to bridges, buildings and steel structures, one acid resisting for vats, tanks, &c., wood preservative for exposed wooden structures and water proof coating for canvas covered decks and wagons and for tunnels, shafts, conduits, &c.

Machine Tools.—Walcott Machine Tool Company, Jackson, Mich. Three circulars. Pertain respectively to 22-inch engine lathe with turret on shears, new rack cutting machine, and 16-inch elliptical gear crank shaping machine with back gear. Each circular gives a half-tone illustration of the tool and a short description, with table of dimensions.

Water Tube Boilers.—McNeil Boiler Company, Akron, Ohio. Celluloid covered blotter pads advertising the Cook vertical water tube boiler.

The Fort Wayne Iron & Steel Company, Fort Wayne, Ind., is sending to its customers a handy vest pocket book of information, including the bar, band and hoop cards and lists of sizes rolled.

Steel for Automobile Use.

BY THOS. J. FAY.*

In bridge construction the stresses set up in the various members may be estimated almost to a degree. For this work it is practicable to employ steel of the quality obtainable in structural shapes and with a liberal factor of safety bridge construction at the hands of trained experienced engineers may be regarded as an exact science. Designers of motor cars are beginning to realize that a motor car is not merely an aggregation of the usual grades of metal, mounted on four wheels and propelled by a hydrocarbon motor. The problem presented is quite different from that of a bridge, nor can it be solved in the same way. It is one thing to make inert steel bear a burden as in a bridge, but quite another to subject steel not only to load stresses but to shock stresses such as the rough roads common in America introduce. Foreign motor cars were very successful in such countries as France and Germany, but when they were brought to America they found conditions they were not adapted to.

If no further progress were made motor cars would be a permanent fixture. Improvements, however, are being made from time to time that for the most part do not show on the surface. It takes a discriminating buyer in these days to tell a good car from a car that is not so good, for to a considerable extent they look the same. Among the improvements that are now to be had in the higher price cars the most important but the most difficult to see are improvements in the quality of the metal employed. In cars of this class it is no longer the practice to purchase the best metal the market affords, but to purchase heats of special metal, possessing properties not usual to stock product. The metal is often obtained from foreign mills, simply because American mills have overlooked the motor car trade, or do not care to experiment with the grades of metal it requires. Of these the most conspicuous are nickel steel and chrome nickel steel. The nickel steel made in America is entirely suitable for certain work.

Table I gives the analysis and properties of a special nickel steel that is a good metal for axles and knuckles.

Table I.—Special Nickel Steel.

Chemical Composition.

	Per cent.
Carbon	0.3 to 0.25
Nickel	3.5 to 3.4
Silicon	0.1 to 0.08
Sulphur	0.03 to 0.025
Phosphorus	0.04 to 0.032
Manganese	0.17 to 0.14

Physical Properties.

Ultimate tensile strength, pounds per square inch	119,000 to 102,226
Yield point, pounds per square inch	86,000 to 75,000
Elongation, per cent	16.1 to 14.5
Reduction of area at yield point, per cent	73.4 to 64

The elastic limit is high and in comparison with steel this metal is superior for the reason that when subjected to alternate stresses it is not subject to sudden rupture. The grain is close, the fracture clean and cracks do not follow up. In using this metal the secret of success is in its treatment as it comes from the mill. After suitable treatment the elastic limit is increased and the grain is even closer, yet it cuts easier than 20 carbon machine steel.

Chrome-nickel steel possesses many of the good qualities of nickel steel and has its own individuality besides. For certain parts, particularly gears and pinions, chrome-nickel steel is superior to nickel steel and its physical properties are good in almost every way as the tests in Table II show.

Table II.—Chrome-Nickel Steel.

Chemical Composition.

	Per cent.
Carbon	0.5 to 0.4
Nickel	1.4 to 1.33
Chromium	3.26 to 3.05
Silicon	0.12 to 0.04
Sulphur	0.03 to 0.156
Phosphorus	0.04 to 0.035
Manganese	0.19 to 0.158

Physical Properties.

Ultimate tensile strength, pounds per square inch	162,300 to 114,600
Yield point, pounds per square inch	124,600 to 89,000
Elongation, per cent	10.2 to 7.3
Reduction of area at yield point, per cent	61.3 to 42

This metal may be made up in divers qualities varying the chrome, nickel and carbon with suitable changes in silicon, sulphur, phosphorus and manganese. The use to which the metal is put depends upon the nature of the service, which also determines the proportions of the compound to be used in the make up of the metal. The future holds still further improvements, such as the adaptation of tungsten-chrome-nickel steel, a metal that even in its experimental stage suggests wonderful possibilities.

Carbon steel is not being abandoned by any means, for in certain specific classes of service it is the equal of them all. This does not refer to the ordinary market product known as machine steel. In some work the carbon component is reduced below 0.08, while in other work it reaches over 100 points, whereas in machine steel of the market the carbon usually ranges between 15 and 45 points, and is rather higher in phosphorus than that desired in motor car metals.

In selecting metals for motor cars the ultimate tensile strength and even the elastic limit are secondary factors. What is really sought is metal that will not fatigue under the alternate rapid stresses to which it is subjected. Whether or not the metal will weld is immaterial, for in the best motor cars there are no welds. Attention should be paid to these matters if the car is to be capable of running satisfactorily on American roads, and not to ground clearance alone. Some of the earlier types of cars cleared the ground by more than 18 inches with the result that they were unfit for service, the center of gravity being much too high. It is a fallacy to suppose that the measure of ability to withstand American roads depends upon the ground clearance. The thing to be considered is the metal used, which must be one that will withstand alternate shock loads, some of which are greater than the elastic limit of 20 to 30 carbon machine steel in any area of section that the weight limit will allow.

* Engineer of the Smith & Mabley Mfg. Company, builders of the Simplex automobile.

The Chicago Teamsters' Strike.

The Chicago teamsters' strike, which has been in force since April 6 and which threw out of employment 4500 teamsters, or something over 10 per cent. of the entire number of teamsters in the city, has been practically lost by the strikers, one teamsters' local union after another making its formal surrender. The employers, however, have insisted that they will not reinstate any of their striking teamsters until all the unions in the city have formally repudiated the strike. About the only bone of contention left is a demand on the part of employers that union men shall not display their union buttons, and one after another of the unions is acceding to this demand. This strike has cost the city of Chicago itself approximately $1,000,000 for increased police expenses and has cost the employing firms a very much larger sum because of inconvenience and greater expense in handling their traffic, while the greatest losers have been the strikers, the aggregate of whose wages lost during the four months is of course very large. The strike was characterized by much violence, no less than 35 deaths and several hundred serious assaults being charged directly to this contest. During the life of the strike the Chicago Employers' Association has been very active in supplying affected firms with non-union labor and has met with great success in this effort.

The most important outcome of the strike is the exposure before successive grand juries of currupt methods used on the part of employers to sway the influence of the labor leaders in their behalf and against their competitors, it being shown in many instances that strikes not only among teamsters but among other labor unions have been directly precipitated by bribes paid to labor leaders by employers. The habit of bribing labor leaders to call off strikes or to avert them was also shown to be sufficiently general to make activity on the part of the leaders extremely profitable to themselves. It is thought among the better interests of Chicago that this strike has cleared the atmosphere to such an extent that that city will no longer be looked upon as a hotbed of violence and labor injustice and that representative interests have at last succeeded in ridding themselves of the domination of corrupt labor leaders.

NEWS OF THE WORKS.

Iron and Steel.

The Fieser-Bentley-Warner Company, Columbus, Ohio, contemplates erecting a blast furnace in Ohio in the near future. It will be 18 x 80 feet, will use West Virginia coke and lake ore, and will have an anpual capacity of about 100,000 tons of Bessemer, malleable and foundry pig iron. A site for the furnace has not as yet been selected. The officers of the company are R. S. Warner, president; Alexander W. Thompson, vice-president; Linn Bentley, secretary and superintendent; W. F. Fieser, treasurer.

The Buffalo Union Furnace Company, Buffalo, N. Y., had all three of its furnaces running on June 30. Furnace C, which has heretofore made charcoal iron only, was operated on coke alone during the first half of 1905.

The Duncannon Iron Company is making further improvements to its mills at Duncannon, Pa.

Sam Lanham Furnace, at Rusk, Texas, has been placed in operation after considerable improvements. When the new engine is installed it is expected the stack will make from 75 to 80 tons per day.

One of the stacks of the Empire Iron & Steel Company, at Reading, Pa., has been blown out for repairs, and Emaus Furnace, which has been out of blast for some time, will be started up this week.

A dispatch from Pittsburgh states that the Moorhead Brothers' rolling mills at Sharpsburg, Pa., have been closed down on account of lack of raw material.

The National Tube Company has placed a large and important order, for immediate execution, with the American Blower Company, Detroit, Mich. The contract embraces complete heating equipment for the company's five new butt weld mills at Lorain, Ohio.

The Maryland Rail Company, Cumberland, Md., which recently bought the Schonthal Iron & Steel Company's plant in that city, now has it in operation, manufacturing 16 to 40 pound rails and splice bars. The company's own plant was damaged by the bursting of a fly wheel last week, and it found that it would take some six weeks to rebuild it.

The new 84-inch plate mill of the La Belle Iron Works, Steubenville, Ohio, is about completed and will probably be started this week. The mill proper, including housings, rolls, tables and shears, was built by the United Engineering & Foundry Company, the engine by Mackintosh, Hemphill & Co., and the building containing the mill was erected by the Riter-Conley Mfg. Company, all of Pittsburgh. Sufficient business has been booked to keep the mill filled up for some time after it is started.

The Fort Wayne Iron & Steel Company, Fort Wayne, Ind., at its annual directors' meeting, held last week, re-elected the entire list of officers, as follows: E. F. Yarnelle, president; C. H. Rawlins, vice-president and general manager; H. C. Rockhill, secretary; J. W. Sale, treasurer; A. W. Tyler, superintendent; P. H. Joyce, general sales agent. The directors also gave the management authority to add at least two furnaces to their muck mill and to make a number of minor improvements. Work on these improvements will be undertaken at once, and officers of the company state that when they are completed the Fort Wayne mill will have the largest producing capacity of bar iron of any independent plant in the West.

The Chesapeake Nail Works, at Harrisburg, Pa., have started up in all departments after being idle for about 30 days. The puddle mill and nail factory are to be run indefinitely.

The Standard Steel Company has started the erection of a 100-foot addition to its wheel mill at Burnham, Pa. The addition will be of steel. Improvements have also been made to the wheel finishing mill. More men are to be added to the boring mill.

Fannie Furnace of the Cherry Valley Iron Company, at West Middlesex, Pa., has been blown out for relining and repairs, and will probably be ready for blast in about six weeks. J. W. Rhodes, president of this concern, is making a tour of the ore regions this week.

General Machinery.

The Detroit Forging Company, Detroit, Mich., is erecting a new storage building. The company has gone very largely into drop forge goods, and will use a large portion of its plant for this work, making necessary the furnishing of additional storage room.

Plans have been completed for the new shops which the Southern Pacific Railroad is to erect at Bakersfield, Cal. The main building will be 60 x 200 feet.

Coggins & Owens, Baltimore, Md., machinery dealers, have started the erection of a new warehouse at 19 South Charles street. The building will be five stories high, on a lot 21 x 168 feet, and will have all modern improvements.

Henry Stark, Joplin, Mo., has about completed plans for a new boiler and machine shop, to be located at Thirteenth and Wall streets. The new building will be two stories high and will increase the present capacity considerably. What new machinery is required has been arranged for.

The roll department of the plant of the George A. Hogg Iron & Steel Foundry Company, Pittsburgh, is being operated night and day to keep up with orders. Business in the machine department has not been quite so active, but a good many orders are being booked. Among these are two rolling mills with rolls 16 x 72 inches for rolling special material for the Abbe Engineering Company, New York; a 12-inch train of rolls complete for the Iron Company of America; a 12-inch train complete and a roll lathe for the Old Dominion Iron & Nail Company, Richmond, Va.; an 18-inch muck mill and engine for the Wilkes Rolling Mill Company, Sharon, Pa., and a 60-inch motor driven roll lathe for the National Tube Company, Pennsylvania Department, Pittsburgh.

Among the work that the Robins Conveying Belt Company, New York, now has on hand is the contract for additional belt conveyors for the Chicago gas plant of the Semet-Solvay Company, an order for the mast and gaff rig and belt conveyors for the New York Contracting & Trucking Company, for use in excavating work at the Pennsylvania Railroad Station in New York, and the contract for a belt conveyor to be used by F. N. Stillman & Co. of Jersey City, N. J., in connection with some large excavating work which they now have on hand.

Power Plant Equipment.

Proposals will be received until August 26 at the office of the chief quartermaster, San Antonio, Texas, for a 40 horse-power steam boiler for the pumping station at Fort Ringold.

Orders have been received by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., from Nelson, Morris & Co., for 19 type CCL induction motors, varying in sizes from 5 to 50 horse-power, and totaling 410 horse-power, and for eight motors of the same type from the Decatur Car Wheel & Mfg. Company, Birmingham, Ala. These are the latest design of induction motors which have been built by the company and have just recently been placed on the market. Orders have also been received from the Illinois Steel Company for 80 direct current motors having an aggregate capacity of 3920 horse-power, of the railway type, and range from 30 to 75 horse-power; The Hawaiian Electric Company, Honolulu, two 1200-kw., three-phase, 2200-volt engine type generators; two 125-kw. exciters, and seven 500-kw. oil insulated self cooling transformers; Rumford Falls Power Company, Rumford Falls, Maine, one 550-kw. and one 800-kw. alternating current generators, which will be direct connected to water wheels. This last order includes two 450 horse-power variable speed induction motors and 120 type OD transformers for use on the distributing lines.

Erwin & Co., Chicago, have incorporated with a capital stock of $60,000. The firm has been in business for 16 years, manufacturing house pumps, triplex power pumps, cellar drainers, water lifts and pumping engines. O. R., H. O. and J. A. Erwin are the leading stockholders.

The Pittsburgh office of the Hooven-Owens-Rentschler Company, Hamilton, Ohio, James E. McNary, manager, recently furnished the Interurban Construction Company, Wheeling, W. Va., two 30 x 40 inch heavy duty Hamilton Corliss engines, direct connected to Westinghouse generators.

The Chattanooga Boiler & Tank Company, Chattanooga, Tenn., which was recently incorporated with a capital stock of $25,000, has purchased a plant and equipped it with the necessary machinery to build boilers, tanks, stand pipe, steel towers, and to do all kinds of plate and sheet iron work. N. H. Grady is president; S. H. Daniels, secretary and treasurer, and F. P. Jenkins, vice-president and superintendent.

It is understood that the Allis-Chalmers Company, whose headquarters are in Milwaukee, Wis., intends to enlarge its plant at Scranton, Pa. The improvements are expected to include a new building to be used for office purposes, and the present office quarters in the machine shop will be utilized for manufacturing purposes.

The J. V. Hicks Gas Motor Company, Waycross, Ga., has erected a plant, 50 x 100 feet, for the manufacture of the Hicks patent tandem gas engines and automobiles. Part of the machinery has been purchased. The company expects to have the plant running in about 60 days.

The Western Gas Engine Company, Los Angeles, Cal., has purchased an 8-acre site on the Santa Fé Railroad, upon which will be erected a new plant. It is likely that the capital stock will be increased to provide for the improvements.

The New River & Pocahontas Consolidated Coal Company, an allied interest of the Berwind-White Coal Mining Company, has recently purchased from Col. W. P. Rend a large body of New River coal near Thurwood, W. Va., on the Chesapeake & Ohio Railway. This property has four well developed mines in operation and the capacity of these will be largely increased. Contracts were placed last week for a complete electrical power plant, by George R. Wood of Pittsburgh, consulting electrical engineer for the company. The Westinghouse Electric & Mfg. Company was awarded a contract for three 300-kw. engine type three-wire generators, with complete switchboard equipment. Dravo-Doyle & Co. will furnish three 600 horse-power cross compound Erie Ball engines, to operate noncondensing, and contract has also been placed for three 300 horse-power Sterling water tube boilers. This plant will operate mining machines, locomo-

tives, fan and pump motors, &c., and will be the largest electrical coal plant in the New River district.

Foundries.

Interests connected with the American Brake Shoe & Foundry Company, New York, have organized the American Malleable Company to operate the Lancaster Malleable Iron Works, Lancaster, Pa., which they have purchased. The plant is estimated to be worth $100,000.

The Wilmington Malleable Iron Company, Wilmington, Del., is to erect a new building, 30 x 228 feet, which is to be used as a finishing mill in connection with its iron plant. No new machinery will be required.

The Industrial Brass & Iron Foundry is the name of a new concern which has taken the old Printz Foundry, Ninth street, Reading, Pa.

The Leighton & Howard plant of the American Steel Foundries, at East St. Louis, Ill., has closed down.

The Lewistown Foundry & Machine Works reports enough orders to keep its plant at Lewistown, Pa., busy all summer. The plant is now being run overtime and more mechanics are needed.

The Sharon Foundry Company, founder and machinist, Sharon, Pa., works at Wheatland, Pa., is erecting a 20-ton open hearth furnace and will make steel castings as well as gray iron castings. The furnace is expected to be ready for operation about October 15. P. McManus, for a number of years with the American Steel Castings Company, now the American Steel Foundries, and for the past two years superintendent of the Sterling Steel Foundry at Braddock, Pa., will have charge of the plant as superintendent. The other officials of the Sharon Foundry Company are Joseph Riddell, president, and Thomas Kennedy, secretary and treasurer.

Bridges and Buildings.

The United States Wind Engine & Pump Company, Batavia, Ill., has commenced the erection of a one-story 50 x 150 foot building, which will be devoted to the manufacture of steel towers and substructures for supporting railroad water tanks, sprinkler tanks, electric cable towers and the like. The building will be of stone, with a steel trussed roof.

The Minneapolis Steel & Machinery Company, Minneapolis, Minn., has been awarded a contract by the Board of Supervisors of Lee County, Iowa, for 16 steel bridges, aggregating a total cost of $22,300. There will be four 100-foot spans, one 120-foot span, one 80-foot span, one 75-foot span, eight 60-foot spans and one 56-foot span.

Fires.

The foundry of Henry Allard & Sons, Glens Falls, N. Y., was destroyed by fire last week. The loss is about $5000.

The plant of the Pittsburgh Pulley Company, near McKees Rocks, Pittsburgh, was destroyed by fire last week. The plant will probably be rebuilt on the present site as soon as the insurance is adjusted, and considerable new equipment for foundry purposes will be needed.

Hardware.

The directors of the Spencer Automatic Machine Screw Company, Hartford, Conn., have voted to recommend to the stockholders the closing up of the business, and the matter will be acted upon at a stockholders' meeting in the near future. The plant of the company has been closed for some time, undergoing repairs.

The business of the Our Husbands Mfg. Company, Lyndon, Vt., has been incorporated under the laws of Maine with these officers: President, I. H. Hall; treasurer, A. B. Pratt; secretary, I. H. Hall, Jr. The company manufactures the Common Sense calf feeder and has added to its line a new fruit picker, the invention of A. B. Pratt. The business was established in 1899.

The Clipper Lawn Mower Company, Dixon, Ill., has filed incorporation papers. R. K. Ortt, James Knox and J. E. Bast are the incorporators.

The Wilson Saw & Mfg. Company, Port Huron, Mich., which is the result of the amalgamation of the Port Huron Saw Company and the Port Huron Steel & Screw Works, is branching out into several new lines of manufacture, including hand saws and hack saws. Heretofore the product has been only band, circular and long cross-cut saws. The company also operates a steel novelty department, in which the manufacture of bicycle pedals has been gone into quite extensively. Over 100,000 pairs were turned out during the past season.

The Gadue Flour Sifter Company, Burlington, Vt., has been incorporated with a capital stock of $10,000. The incorporators are Robert Noble, H. B. Shaw, George E. Hack and W. A. Gadue, Burlington, Vt., and Herbert W. Allen, Woodsville, Vt. The company is marketing a flour sifter in a small way. It is not yet determined whether or not a larger factory will be established. If the decision is reached to establish a business on a considerable scale a large amount of new machinery will be needed. As it is the company will have to buy some tools. Communications addressed care of Robert Noble, Northern Supply Company, Burlington, will reach the company.

Miscellaneous.

The Ohio Brass Works, Mansfield, Ohio, has had plans prepared for rebuilding its plant, recently destroyed by fire. The new plant will comprise four buildings.

The recent fire at the plant of the Damascus Brake Beam Company, Sharon, Pa., was of no consequence. The building was immediately repaired and operation of the plant was only interfered with for a day or two.

The Asher Mangle Company, Willimantic, Conn., has been incorporated in Connecticut to manufacture and deal in laundry machinery. The president and treasurer of the company is W. J. Asher and the secretary is W. P. Allen. The company is having its machines built under contract for the present.

The recent fire at the Ireland & Matthews Mfg. Company's plant at Detroit, Mich., only destroyed the packing department. Repairs have been made.

The Pressed Steel Car Company recently booked orders in one week for 3100 cars, representing a value of $3,000,000.

The Richmond Pattern Works, Richmond, Va., has incorporated as the Richmond Pattern & Structural Iron Works. With increased capital and better facilities the new company will carry on the business on a larger scale and will also carry in stock all sizes and shapes of structural steel and bar iron. E. M. Liphart is president; R. T. Liphart, vice-president; F. FitzGerald, secretary and treasurer, and L. W. Brander, assistant secretary and treasurer.

The Jaynes Automobile Company has been incorporated at Buffalo, N. Y., with a capital of $100,000. Directors: W. C. Jaynes, Buffalo; F. I. Alliger, Tonawanda, and C. B. Birney, North Tonawanda, N. Y.

An addition to the plant of the Youngstown Car Mfg. Company, at Youngstown, Ohio, has been completed and will be put in operation this week. The main building is a brick structure 80 x 200 feet and is fitted with modern appliances and machinery for the manufacture of steel hoppers and dump cars for steel plants, rolling mill, mining and construction purposes, in addition to the wooden cars the concern is now building. The new plant will be operated by electric power, which will be furnished by two 85 horse-power Westinghouse gas engines, located in the company's own power plant, which also contains two large combination gas engines and dynamos, electric pumps, electric air compressors and other electric appliances.

The C. E. Bonner Mfg. Company, Chrisman, Ill., has increased its capital stock from $30,000 to $250,000. The company manufactures pipe wrenches.

The Logansport & Wabash Valley Gas Company, La Fayette, Ind., has contracted with the Western Gas Construction Company of Fort Wayne for an installation of three plants for the manufacture of coal and water gas for fuel and illuminating purposes. These plants will be erected at Logansport, Peru and Wabash. The distance between Logansport and Wabash is about 30 miles, with Peru midway between. The plants will be connected with 6 and 8 inch mains.

Exporting Ferrochrome.—It is an interesting fact that American ferrochrome is being exported to Europe. The Willson Aluminum Company, whose works are at Holcomb Rock, Va., has been making shipments of ferrochrome on long time contracts since last midsummer. The ferrochrome is distributed from Liverpool and has gone to some of the principal armor plate makers of England and to manufacturers of projectiles. The shipments of the Willson Aluminum Company amount to upward of 50 tons per month.

According to *Le Yacht*, the three new French submarines, Opale, Emeraude and Sapphire will be the largest yet constructed. Their displacement is to be 422 tons, the length 146.5 feet, the beam 12.8 feet. They will have each two propellers, actuated when on the surface by gas engines, and when submerged by electric motors drawing their current from accumulators. The engines will develop 600 horse-power, with a corresponding speed of 12 knots. Each boat will carry six torpedo tubes. They will be more habitable than boats of previous types and will have an increased radius of action.

A new floating dock in the shipyard of the Aktien Gesellschaft Neptun, at Rostock, Germany, is composed of three sections, each of which may be used independently, but only two are at present in service. The combined lifting capacity of the two is 3000 tons. Each section has a length of about 130 feet, a width over all of 80 feet, an inside width of 63 feet, a depth of 32 feet, and a pontoon depth of 7.4 feet. It is not by any means a large dock, but it has been constructed upon the Dieckhoff system, which has given splendid satisfaction in operation, and much is expected of it.

The Iron and Metal Trades

The Iron trade generally continues in a very sound and satisfactory condition. The rush of buying in the Southern field is over for the present, and in the leading distributing markets Southern Iron is slightly easier, since some of the smaller companies are willing to sell on the basis of $11.50 for No. 2 at Birmingham. The larger interests who sold heavily lately are asking better prices. A lot of 4000 tons of Gray Forge was sold for Pittsburgh delivery at a rather low price.

Considerable further quantities of Malleable Bessemer Pig have been marketed during the past week, and in the Chicago territory the condition of furnaces is such that the supply is rather restricted.

The demand for Billets and Sheet Bars has continued good and prices are higher, with some good business pending in eastern Pennsylvania both for Steel and for Muck Bars.

The Rail mills are full of work. Some large orders which have been pending have not yet been placed. For some small lots for September delivery some of the large systems have indicated a readiness to pay a moderate premium.

The condition of the Structural trade is well illustrated by the fact that the United States Steel Corporation has started to build a mill for rolling Structural Shapes at the Clairton plant. This mill, which will have a monthly capacity of 10,000 tons of Shapes, ranging from 4 to 8 inches, is to be completed in the extraordinary time of 13 weeks.

The Plate trade is looking forward to a heavy additional tonnage for the large lot of Steel cars for which the Pennsylvania lines west of Pittsburgh are in the market.

Agricultural implement makers have entered into additional season contracts for Steel Bars.

The strong position of Steel is having its reflex action upon Sheets, in which concessions are not being made as freely as some time since.

The general demand for Pipe shows a little improvement. The oil country requirements are fair and the buying of Boiler Tubes is good.

There are at hand the first indications of the approach of the buying of Wire products for the coming season, but the movement has not yet become pronounced. It may do so at any time between now and the middle of August, when the season really opens.

The Eastern Scrap trade shows some excitement among dealers and prices are firm and advancing.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 2, 1905.	July 26, 1905.	July 5, 1905.	Aug. 3, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	$16.25	$16.25	$16.25	$14.25
Foundry Pig No. 2, Southern, Cincinnati	**14.50**	14.50	14.00	12.00
Foundry Pig No. 2, Local, Chicago	**16.50**	16.25	16.00	13.25
Bessemer Pig, Pittsburgh	**15.10**	14.85	14.85	12.85
Gray Forge, Pittsburgh	*14.50*	14.50	14.60	11.85
Lake Superior Charcoal, Chicago	**17.00**	16.50	16.50	14.50
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	**24.00**	23.00	21.00	23.00
Steel Forging Billets, Pittsburgh	**25.00**	25.00	24.00	...
Steel Billets, Philadelphia	**26.50**	26.50	26.00	24.00
Steel Billets, Chicago	**28.00**	28.00	27.00	22 00
Wire Rods, Pittsburgh	**32.50**	32.00	32.00	28.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	**14.00**	14.00	12.50	10.00
O. Steel Rails, Philadelphia	**16.00**	16 00	15.25	11.50
O. Iron Rails, Chicago	**18.75**	18.75	17.25	15.00
O. Iron Rails, Philadelphia	**18.50**	18.50	18.00	13.75
O. Car Wheels, Chicago	**14.75**	14.75	14.25	11.00
O. Car Wheels, Philadelphia	**15.00**	14.50	14.50	10.50
Heavy Steel Scrap, Pittsburgh	**14.25**	14.25	13.50	11.00
Heavy Steel Scrap, Chicago	**13.00**	13.50	12.25	9.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.48½
Common Iron Bars, Chicago	**1.55**	1.50	1.50	1.30
Common Iron Bars, Pittsburgh	1.55	1.55	1.55	1.30
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.32½
Skelp, Sheared Steel, Pittsburgh	1.55	1.55	1.55	1.32½
Sheets, No. 27, Pittsburgh	**2.20**	2.20	2.15	2.00
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.45
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.85
Cut Nails, Mill	1.80	1.80	1.80	1.65
METALS:				
Copper, New York	**15.60**	15.12½	15.00	12.50
Spelter, St. Louis	**5.45**	5.40	5.07½	4.75
Lead, New York	**4.60**	4.60	4.55	4.20
Lead, St. Louis	*4.55*	4.50	4.85	4.00
Tin, New York	**33.00**	32.90	30.80	27.00
Antimony, Hallett, New York	**14.00**	13.50	12.00	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.49

Chicago.

FISHER BUILDING, August 2, 1905.—(*By Telegraph.*)

After the flurry in Pig Iron which added $1.25 to the cost of Southern product the general Iron and Steel trades have settled down to normal conditions, with a strong tone prevailing on all the finished products, with the exception of Sheets, Pipe and Wire. Even in these weaker lines there is evidence of a better feeling, that may be reflected later on in higher prices. Structural Steel, Rails and Plates are as strong as can well be imagined, with mills full of business and deliveries greatly delayed. An unusual volume of business in the whole Iron and Steel list is being transacted for the first week in August, and each week of favorable crop reports adds to the activity. Sharp advances are noted in the non-ferrous metals.

Pig Iron.—The heavy buying movement which accompanied the upward march of prices during the last three weeks has practically come to an end, melters of Iron generally having provided for their nearby needs at least. The heaviest buying has been on the part of Malleable Iron works throughout the West, and the majority of these have covered their requirements for the greater part of the last half of the year. Jobbing Gray Iron foundries have not, as a rule, bought as heavily as was expected and a considerable tonnage is yet to come from that source. Where it was estimated on July 1 that 80 per cent. of all the Iron required in this market for the second half of the year was yet to be bought, it is now estimated that but little over 25 per cent. is yet unpurchased. While the large buying movement has ceased business is by no means at a standstill, as current orders for small lots are still coming in daily. A feature of the market that is encouraging is the fact that so many melters are urging immediate shipment, indicating that buying was delayed to the last moment and that the yards are

empty. This rush for Iron is with difficulty taken care of by the furnaces, and prediction is made that the time is not far distant when a premium of 25c. a ton or more will be paid for car numbers. One factor in this shortage of supply lies in the fact that a number of Northern furnaces have been out of blast part of July, including the Zenith at Duluth, the furnace at Spring Valley, which is being rebuilt; the plant at Mayville, where production is being interrupted by preparations for rebuilding, and even the Thomas Furnace at Milwaukee was out of blast for several days. Neither the United States Steel Corporation nor the Harvester Company has any considerable quantity of Iron which it will sell, and, indeed, the visible supply of local Northern Iron is rather limited. Supply from the South is said to be curtailed by the difficulty of securing competent labor. The weak point in the whole Pig Iron situation is the Ohio furnaces, and it is this weak spot that prevented Iron from advancing above the present basis. Prices ruling to-day are as follows:

Lake Superior Charcoal	$17.00 to $17.50
Northern Coke Foundry, No. 1	17.00
Northern Coke Foundry, No. 2	16.50
Northern Coke Foundry, No. 3	16.00
Northern Scotch, No. 1	17.50
Ohio Strong Softeners, No. 1	17.30
Ohio Strong Softeners, No. 2	16.80
Southern Silvery, 4 to 6 per cent. Silicon	16.65 to 17.65
Southern Coke, No. 1	16.15
Southern Coke, No. 2	15.65
Southern Coke, No. 3	15.15
Southern Coke, No. 4	14.90
Southern Coke, No. 1 Soft	16.15
Southern Coke, No. 2 Soft	15.65
Southern Gray Forge	14.65
Southern Mottled and White	14.40
Malleable Bessemer	16.50 to 16.75
Standard Bessemer	16.80 to 17.05
Jackson Co. and Ky. Silvery, 6 to 8 % Silicon	18.30 to 18.55
Jackson Co. and Ky. Silvery, 8 to 10 % Silicon	20.30 to 20.55
Alabama Basic	16.15 to 16.65

(*By Mail.*)

Billets.—Forging Billets are still quoted at $28 to $30 for shipment from mill, in car lots and greater, with as high as $32 being paid for less than car lots from mill or store.

Rails and Track Supplies.—There is no sign of a decrease in the inquiry for Rails, but it so happens that no tonnages of any moment were closed by Western representatives of the mills during the week under review. There was, however, a good aggregate tonnage made up of a number of small orders. Prices on Standard Section Rails are firm at $28, f.o.b. mill, with full freight to destination. Light Section Rails down to 12-lb. Sections are offered at $24 to $27 a gross ton, f.o.b. mill, while 10-lb. and 8-lb. are offered at $28 and $29. Angle Bars are unchanged at 1.40c. to 1.50c. Spikes are rather weak at 1.70c. to 1.75c., f.o.b. mill, in car lots, Eastern mills offering 1.70c. and Pittsburgh mills holding at 1.75c. or above. Track Bolts are quoted at 2.40c. to 2.50c., base, Square Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—In spite of the fact that the mills are far behind their orders, the leading producer, for instance, naming the first quarter of 1906 delivery as the best it can make, demand for Structural Steel continues to be good and orders are being placed daily for good tonnages. The aggregate tonnage of Structural Steel that will go into cars, bridges and buildings the present year will be very great. Officers of the Illinois Steel Company state that until the new mill at South Chicago is in actual operation no effort will be made to book orders to be executed at that mill. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.10c. to 2.50c., according to quantity on hand in store or obtainable from mill.

Plates.—The report of this market resolves itself into the problem of chronicling in a different way each week an unbroken period of strength, with conditions growing stronger each week rather than the reverse. Prices are unchanged and firm, as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—The improvement in the Sheet market noted last week is a little more marked if anything this week, and while prices are not officially changed there is less of the extremely low priced material offered than there has been for several months. Actual prices paid to independent mills for current requirements range about as follows, though prices are so irregular that $1 a ton higher or lower could easily be accounted for: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.11½c. to 2.16½c.; No. 27, 2.31½c. to 2.36½c.; No. 28, 2.41½c. to 2.46½c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.50c. for Nos. 18 and 20 Box Annealed, 2.65c. for No. 27 Box Annealed and 2.75c. for No. 28 Box Annealed. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at $1 a ton less: No. 10, 2.41½c. to 2.46½c.; Nos. 17 to 21, 2.81½c. to 2.86½c.; No. 27, 3.31½c. to 3.36½c.; No. 28, 3.51½c. to 3.56½c. Store prices on Galvanized Sheets are as follows: Nos. 10, 12 and 14 are selling at from 3c. to 3.10c., Nos. 22 and 24 at from 3.05c. to 3.15c., No. 27 at from 3.50c. to 3.65c. and No. 28 at from 3.70c. to 3.95c., with intermediate gauges in proportion and with customary differentials for widths and lengths.

Bars.—Steel Bars are gaining in strength and contracts for large tonnages are being booked, particularly with the implement trades. On Iron Bars 1.55c. is the minimum of the three largest producers in the West and there is a disposition to stay out of the market, except for nearby shipment, even at that price, holding as a general thing at 1.60c. for fourth quarter or refusing to name prices altogether for delivery beyond September. We quote Iron Bars, 1.55c.; Steel Bars, 1.66½c., both half extras; Hoops, 1.81½c. rates, full extras; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Mills are so well filled with business as a general thing that they are making but little effort to book any considerable tonnages at the present time, as there is hope on their part that prices may rule higher later on. Current prices are unchanged, as follows, officially at least: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—The ruling selling price of base sizes of Merchant Pipe, ¾ to 6 inches, from store, is on the basis of 76 per cent. discount, Chicago, for reasonably large lots and 75 per cent. for the smallest, with 66 and 65 per cent. discount on Galvanized Steel Pipe. Iron Pipe is sold about $3 a ton higher than Steel in both Black and Galvanized. The price at which jobbers buy in Chicago either from the leading producer or from independents is, of course, below these figures.

Boiler Tubes.—This continues to be a strong market and the official prices named by the leading producer are well maintained, as follows, f.o.b. Chicago, in car lots: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.85. Store prices are, nominally at least, unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—Current business in small lots is good and there are a number of sizable contracts to be figured on, none of which has been closed, however, during the week under review. The following prices represent figures that will be quoted on car lots and greater, large tonnages, of course, securing lower prices: Water Pipe, 4-inch, $29; 6, 8 and 10 inch, $28; 12-inch and larger, $27, per net ton, with $1 extra charged for Gas Pipe. Large tonnages bought by municipalities on a competitive basis bring out considerably lower prices.

Coke.—Coke continues to be strong, with $5 to $5.15 the ruling prices on 72-hour Connellsville. Somewhat better than this, though, is done in some instances. Foundry Coke from less favored regions is offered at from 25c. to 50c. lower than Connellsville, and furnace grades of Coke range from $1.85 to $2 at the ovens. Wise County, Va., Foundry Coke is still offered at $2.25, at the ovens, or, with the special Louisville & Nashville freight rate, $4.50, Chicago.

Old Materials.—The steady upward movement of prices of Old Materials has received a check as far as some com-

modities are concerned, and is now weak in spots and strong in spots, the tendency being to even up values. A peculiar condition of the market is illustrated by the fact that Cast Scrap has been sold during the last two or three weeks at about 50c. above the cost of Gray Forge Iron. A fair sized list was closed out by the Chicago & Eastern Illinois road, prices ranging a little lower than those secured by the Burlington last week. The following quotations represent the range of prices paid by large consumers from producers and dealers in car lots and greater, f.o.b. Chicago:

Old Iron Rails	$18.75 to $19.25
Old Steel Rails, 4 feet and over	14.00 to 14.50
Old Steel Rails, less than 4 feet	14.00 to 14.50
Heavy Relaying Rails, subject to inspection	23.00 to 23.50
Heavy Relaying Rails, for side tracks	19.50 to 20.00
Old Car Wheels	14.75 to 15.25
Heavy Melting Steel Scrap	13.00 to 13.50
Frogs, Switches and Guards	13.00 to 13.25
Mixed Steel	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates	$16.50 to $17.00
Iron Car Axles	20.50 to 21.00
Steel Car Axles	16.50 to 16.75
No. 1 Railroad Wrought	15.00 to 15.25
No. 2 Railroad Wrought	14.00 to 14.25
Locomotive Tires, smooth	13.50 to 14.00
Railway Springs	12.75 to 13.25
Shafting	15.00 to 15.50
No. 1 Dealers' Forge	11.50 to 12.00
Wrought Pipes and Flues	11.00 to 11.50
No. 1 Cut Busheling	10.50 to 11.00
Iron Axle Turnings	10.50 to 10.75
Soft Steel Axle Turnings	10.50 to 10.75
Machine Shop Turnings	10.00 to 10.50
Cast Borings	8.00 to 8.25
Mixed Borings, &c	8.00 to 8.25
No. 1 Mill	9.25 to 9.50
Country Sheet	8.00 to 8.25
No. 1 Boilers, cut to Sheets and Rings	10.00 to 10.50
No. 1 Cast Scrap	13.00 to 13.50
Stove Plate and Light Cast Scrap	10.00 to 10.25
Railroad Malleable	12.50 to 13.00
Agricultural Malleable	12.00 to 12.50

Metals.—Prices on nearly the whole list show marked advances and the tone of the market is strong, with the volume of business improving. Copper is ¼c. higher, being quoted at 15¼c. to 15⅜c. for Casting Copper and 15⅜c. to 15½c. for Lake, in car lots, with small lots selling ½c. to ¾c. higher. Pig Tin has advanced ½c., being now quoted at 33¼c. to 33¾c. for carloads and 34c. to 34¼c. for small lots. Spelter is strong at 5⅝c. for car lots and 5⅞c. to 6c. for small lots. An advance of $2 a ton has been made in Lead, making the Chicago price 4.65c. for 50-ton lots, 4.70c. for car lots and 5.20c. to 5.30c. for small lots. Sheet Zinc has advanced 25c., the new schedule quoting $7.25, La Salle, for car lots of 600-lb. casks. Deducting discounts and adding freight, the going Chicago prices are $7 for car lots, with smaller lots running from $7.25 to $7.50 per 100 lbs. Advances in new Metals are reflected in advances in the Old Materials. Prices are as follows: Copper Wire, 13⅝c.; Heavy, 13¼c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 12c.; Red Brass Borings, 10c.; Yellow Brass, Heavy, 8¾c.; Yellow Brass Borings, 7⅞c.; Light Brass, 7c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c; Zinc, 4c.; Pewter, No. 1, 21c.; Block Tin Pipe, 25c.

Cleveland.

CLEVELAND, OHIO, August 1, 1905.

Iron Ore.—Although the full figures are not yet in the estimates made to date of the July movement of Ore down the lakes are that it will be slightly in excess of 5,000,000 tons. The movement for June was only a little short of that figure. The wild movement has been curtailed, but the contract boats have been moving rapidly and with their better dispatch have been carrying a great deal of Ore. Estimates of the total movement for the year are being revised. The more conservative place the possible total movement for the year at 28,000,000 tons or a little more. Others make the assertion that it will be fully 1,000,000 tons higher. No change has been made in the carrying charges on wild cargoes, but in certain circles it is indicated that a movement for a reducton might be expected during the week, these commentators suggesting that the reduction will be about 5c. a ton.

Pig Iron.—There has not been much buying during the week, but the tone is evidently stronger. Some of the furnaces have been making contracts for No. 2 Foundry for future delivery at $14.50. Some small lots have sold for immediate shipment at $14.25 in the Valleys. There are some inquiries in the market which indicate buying for the remainder of the year, while some of the consumers want to cover their needs for a longer period. The furnaces have been stronger in the main, most of them holding at $15 for long time delivery. There has been some good inquiry for Basic and Malleable, although the movement in Bessemer is still delayed. The price has a tendency to strengthen. Some Basic for immediate shipment has been sold at $14.25 in the Valleys, although most of the furnaces are holding for $14.75 to $15 for future delivery. The downward tendency seems to have stopped, and although the upward movement has not started prices are edging in that direction. Coke prices are stiffening a little, but have not advanced. The best grades of 72-hour Foundry Coke are selling at $2.40 to $2.50 for the higher grade materials, some of the off Cokes being a little lower. Furnace Coke generally is selling at $2, although that price is sometimes beaten.

Finished Iron and Steel.—The price of Bar Iron advanced $2 a ton during the past week, brought about by the better demand for Iron and the higher prices which are now being paid for Scrap. Indications are that the mills are comfortably filled with orders. In addition there is apparently a big demand in sight. The advance has been general, with a return to the practice of basing the quotations on Youngstown rather than at the mill. The advance does not seem to have stopped the buying movement, consumers taking the stand that they will cover before another increase is decided upon. There has been some further buying of Bar Steel also, many of the consumers who have been holding aloof from the market coming in to cover their needs at present market prices. The buyers number among them some of those who were of the opinion that present prices are too high and who were holding out for a reduction. The market holds steady at 1.50c., Pittsburgh, for both Bessemer and Open Hearth Bars. The demand for Structural Shapes is still in excess of the supply. Many buyers, the number increasing constantly, are forced to rely upon the smaller mills or the jobbers for their material, to whom they are paying premiums ranging from $3 to $5 above the association price of 1.60c., Pittsburgh. There is also an anticipation of some good buying in the near future from the lake shipbuilding interests. The Plate trade is strong, with some sizes hard to obtain, although the situation shows no such stress as is evident in the Structural trade. The price holds at 1.60c., Pittsburgh. The Sheet market is uncertain, with a fair demand and yet nothing extremely brisk. The smaller mills are cutting prices when the business is not forthcoming, but their cuts are getting fewer. Quotations are 2.15c. for No. 10 Blue Annealed out of stock, 2.65c. for No. 28 One Pass Cold Rolled and 3.65c. for No. 28 Galvanized Sheets out of stock. There is still a little buying of Standard Rails for traction use. One or two good inquiries turned up during the week and a couple of contracts were closed for moderate amounts.

Old Material.—The market seems to have a little better tone, although buying has not increased appreciably. Dealers are disposed to hold their Scrap for a little while in anticipation of better prices, while the growing need of the consumers gives reason to hope for better buying later on. Prices are somewhat stronger as a result, although most commodities are quoted nominally. Prices are revised and quoted as follows, all gross tons: Old Steel Rails, $14.50 to $15; Old Iron Rails, $20 to $21; Old Car Wheels, $15 to $15.50; Heavy Melting Steel, $14. All net tons: Cast Borings, $7.50 to $8; No. 1 Busheling, $12 to $13; No. 1 Railroad Wrought, $15 to $16; Iron Car Axles, $21 to $22; No. 1 Cast, $13; Stove Plate, $9 to $10; Iron and Steel Turnings and Drillings, $9 to $9.50.

Rogers, Brown & Co., Pig Iron merchants, announce that their offices have been removed to 1312-1318 Rockefeller Building. S. W. Hubbard and Harwood Wilson are the resident managers.

Cincinnati.

FIFTH AND MAIN STS., August 2, 1905.—(*By Telegraph.*)

Pig Iron.—The buying of Pig Iron has been on a limited plane the past week. It is evident that sales agencies were industrious in informing buyers when the time was ripe for order placing, and the opinion prevails that most consumers in this territory have covered their third quarter of the year requirements at the lower level of prices in force before the advance in Southern Irons. Since the advance in prices there has been only a small tonnage booked compared with the heavy orders placing previously. Southern furnaces have adhered to their quotations of $11.75 to $12, Birmingham, for No. 2, in a general way, but we learn of a few scattered sales at $11.50, Birmingham, basis, and this price can be done on some Southern Irons. At the $12 basis business is insignificant. Gray Forge Iron is still offered at concessions for prompt shipment, and a purchase of about 4000 tons in the Pittsburgh district is reported on the basis of $10.25, Birmingham. Southern Ohio furnaces are practically maintaining a uniform quotation of $14 for No. 2 Foundry, at furnace. There are but few inquiries now in the market, and the little business being done is in small orders. Buyers are as a rule calling for deliveries on Iron bought recently, and general Foundry business is reported fairly good. The trade does not expect pronounced activity in the market now for a time as buyers who have not covered their wants will wait as long as they are able before coming into the market, and by far the greater number have provided for their wants for the coming three months. The

present relation of Northern and Southern Irons in Ohio territory is in favor of the Northern furnaces, and unless Southern Iron declines or Northern Iron advances but little Southern can be placed in the consuming centers in Ohio north of Cincinnati. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$15.00 to $15.25
Southern Coke, No. 2	14.50 to 14.75
Southern Coke, No. 3	14.00 to 14.25
Southern Coke, No. 4	13.75 to 14.00
Southern Coke, No. 1 Soft	15.00 to 15.25
Southern Coke, No. 2 Soft	14.50 to 14.75
Southern Coke, Gray Forge	13.00 to 13.75
Southern Coke, Mottled	12.75 to 13.50
Ohio Silvery, No. 1	18.15 to 18.40
Lake Superior Coke, No. 1	15.65 to 15.90
Lake Superior Coke, No. 2	15.15 to 15.40
Lake Superior Coke, No. 3	14.65 to 14.90
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	$17.75 to $18.25
Lake Superior Car Wheel and Malleable	17.75 to 18.00

Coke.—There is a fair business being done and the market holds steady. Virginia Furnace Coke is scarce for prompt shipment. Furnace Coke is quoted at $1.75 to $1.85 and Foundry Coke at $2.25 to $2.40, f.o.b. ovens.

Plates and Bars.—The demand for Structural Shapes and Plates continues active, with prices strong and deliveries difficult to obtain. Bar Iron is in better demand and firm in tone, but not quotably higher. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—There has been a fairly good business the past week and the market rules firm, with some quotations higher. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $14 to $15 per net ton; No. 1 Cast Scrap, $12 to $12.50 per net ton; Iron Rails, $18 to $19 per gross ton; Steel Rails, rolling mill lengths, $13 to $14 per gross ton; Relaying Rails, 56-lb. and upward, $22 to $23 per gross ton; Iron Axles, $19 to $20 per net ton; Car Wheels, $14 to $15 per gross ton; Heavy Melting Scrap, $12 to $12.50 per gross ton; Low Phosphorus Scrap, $14 to $14.50 per gross ton.

Birmingham.

BIRMINGHAM, ALA., July 31, 1905.

The active pace of the Iron market as reported in last letter did not prevail during the week just ended. If it had prevailed there would have been default on delivery days, for after going over the sales carefully we find that our reports as published rather underestimate than overstate the aggregate of the sales. We now put them at 200,000 tons. The sales of the Sloss Company up to Friday night approximated 100,000 tons. Of this amount 17,000 tons were sold prior to the 14th. This will give one an idea of the activity of the demand.

In stating that the demand has slackened, it is not intended to create the impression that it is either dead or unsatisfactory. On the contrary, there is a very fair, steady demand on the basis of $12 for No. 2 Foundry. Some of the sellers, if they had their way, would suspend further sales until they could ship out the bulk of what has been sold. If the buyers are calculating upon prompt receipts of purchases they will be in many cases doomed to disappointment. The scarcity of labor will be fully appreciated when it comes to the delivery of the large sales of recent date. There is a hustling for it now, in anticipation of its need. The orders in the market the past week were not of the round lot kind, but as a rule were confined to lots ranging from 100 to 1000 tons, with occasionally one that went as high as 1500 or 2000 tons; but these latter orders were not plentiful nor were they coveted by the trade. If any one sold during the week below $12 he covered his tracks well.

There were some cases where it appeared that sales were made on a $12 basis for No. 2 Foundry for delivery during the fourth quarter. That should not be surprising if true, and it is in all probability true; but such sales were limited in volume and tended only to greater firmness on the part of those who could sell. The majority of the interests are quoting for that delivery on the basis of $12.50 for No. 2 Foundry. At this latter price some business has been done, but it has been confined principally to those who wanted certain makes that they had been buying for years and knew just what they could do with them.

There was some feeling of the market on the part of important buyers for delivery during the first quarter of 1906, but they received no encouragement from sellers and the inquiries, as a rule, received the answer that that delivery was not being offered. However, they are interpreted as indicating confidence in the stability of prevalent prices and they give confidence to local interests in the making up of their own diagnosis of the market conditions.

The Foundry trade was a good deal in evidence the past week and Foundry Iron held the boards, the bulk of the sales being of those grades. The Pipe interests took enough during the recent activity to make them easy as to requirements for some time to come.

The president of the Tennessee Company announces that his company will in a short time have in commission three furnaces, now out, and its total then in commission will be 6 at Ensley, 5 at Bessemer and 1 at Oxmoor; say 12 in all. With a prominent furnaceman the question of increased production was discussed and the conclusion was deduced that the increase in output would not be material, because conditions were against it.

The Scrap Iron market is without any change this week and the quotations of last week are renewed, as follows:

Stove Plate	$9.50
Heavy Castings	11.00
Old Steel Rails	13.00
Old Iron Rails	18.00
Open Hearth Steel Scrap	13.50
Iron Car Axles	16.50
Steel Car Axles	14.50
Old Car Wheels	$14.00 to 15.00
Relaying Rails, light	22.00 to 24.00
Relaying Rails, heavy	24.00 to 25.00
Railroad Wrought	15.50

The free sales of Iron have been followed by sales almost as free of Coke. The information is that the bulk of the sales was for forward delivery and they amounted to 60,000 tons or more. Such large purchases tell plainly that we are not making as much as our necessities demand and clearly advertise the fact that we are not free from our dependence upon the Virginia field for our supply of Coke. For Foundry Coke $4 is yet quoted, but for Furnace Coke the price has been materially reduced for deferred deliveries and ranges all the way from $3.50 to $3.75.

The advance of the freight rate was not made as anticipated, and this accounts for the unexpected quotations. In Basic Iron there have been a few transactions at $12.50, which is the quotation now for that grade. But it is highly improbable that a lot of any magnitude could be worked. Rumors are rife concerning the intention of the American Car & Foundry Company to locate here a branch of its business, and E. W. Duncan of that company has been here the past week to look over the situation and investigate the advantages offered. The plant will require a site of 100 acres, and announcement is made that if the plans develop into certainties the company will speedily develop operations here, and will commence with the manufacture of box cars and follow with that of composite and steel cars, employing 2000 men. It will do here what it is doing at its 15 other plants. While it is understood that nothing definite will be determined until the board meeting in September it is the general belief that the plant will be located near here and probably at North Birmingham.

The prominent railroads are now active in the extension of their lines to cover those portions of the mineral and Coal territories whose development will follow their connection with railroad transportation. The Louisville & Nashville Railroad has lately let a 20-mile extension to develop promising Coal properties, and the 'Frisco Company has let a contract for an extension to the Bessie mines controlled by the Sloss-Sheffield Company. The Southern will build very soon the gap to Parrish in the Ensley Southern Railroad. When finished that road will have a completed line to Sheffield and Florence. These extensions mean much for the development of the Coal interests of Walker County, which adjoins this county, and will largely add to the output of Coal.

Arrangements have been made to initiate a movement for the importation of desirable European labor to this district via Southern ports. The effort will be first directed to securing Swedes and Norwegians. Its success will measure the further efforts in this direction.

The Central California Electric Company is to construct a 25,000 horse-power hydro-electric plant on the banks of the American River at Alta Station, about 60 miles from Sacramento. After passing the present pumping station at Alta the water will be conveyed by means of a short canal to a point where a drop of 2100 feet can be obtained. There will be four direct connected turbines of a capacity each of about 6500 horse-power, with polyphase generators operating at a speed of 750 revolutions per minute. The head under which this plant is to operate is equaled, we believe, by only one plant in the United States, the exciter plant of the Pike's Peak Hydro-Electric Railway Company, which has two machines under a head of 2100 feet.

Pittsburgh.

PARK BUILDING, August 2, 1905.—(*By Telegraph.*)

Pig Iron.—The market continues quiet, being practically bare of inquiries, but prices are fairly strong, and on Bessemer and Basic are a little higher, sellers now quoting $14.25, at Valley furnace, or $15.10, Pittsburgh, for both, and several small sales have been made at this price. The market on Bessemer and Basic has not been much below $14, Valley furnace, at any time since the dull spell in the Pig Iron market started, as the average price of actual sales of such Iron in July was only a few cents under $14. About a week ago a local consumer bought 3000 tons of Basic Iron for forward delivery at $13.85, Valley furnace, but this is partly explained by the fact that the Iron runs about 0.50 in phosphorus. There is some small inquiry for Foundry Iron, and the local market is a little stronger in sympathy with the higher prices asked by Southern makers. We note a sale of 2500 tons of Northern No. 2 to an implement concern at $14, Valley furnace, which can be considered the market price for a good sized lot, while for small lots $14.25 is asked. For the first time in several weeks there is some inquiry for Forge Iron, and we quote Northern brands at $13.65, Valley furnace, noting a sale of 1000 tons at this price.

Steel.—The Steel market is one of the strongest we have had for a long time and the Carnegie Steel Company seems to be the only seller of any consequence, the smaller Steel mills needing practically their entire output of Billets and Sheet Bars for their finishing mills and for contracts taken some time ago, so that they have no additional Steel to sell. Bessemer and Open Hearth Billets are quoted at $24, and Sheet and Tin Bars, in random lengths, Bessemer or Open Hearth, are quoted at $25, maker's mill, with 50c. advance asked for Bars cut to specifications. Forging Billets are also higher and we quote these at $25 to $27, maker's mill, depending on carbons.

(*By Mail.*)

The Iron market has undoubtedly a healthier tone, largely due to the great activity of the Steel and Rail trades, the very firm prices on Billets having a strengthening effect on prices of Finished products. The activity in buying of Pig Iron of about two weeks ago, which was largely confined to the Southern district, has quieted down and at the present time there are no large inquiries in the market. However, there is no great pressure on the part of furnaces to sell and prices are fairly strong and a little higher than in July. Bessemer and Basic Iron, which sold last month as low as $13.85, Valley furnace, are now reasonably firm at $14.25 at furnace, with some sellers quoting $14.50. It is very doubtful if any Bessemer or Basic could be bought at less than $14.25 at furnace, and a few small sales have been made at this price. There is some inquiry for Foundry Iron, one implement concern having bought 2500 tons this week on the basis of $14, Valley furnace, for No. 2. While this price was shaded last month in some cases it represents the bottom of the market to-day and small lots bring $14.25 at furnace. Gray Forge has been very dull for several months, but some inquiry has come up in the last few days and we quote Northern makes at $13.65 to $13.75, Valley, or $14.50 to $14.60, Pittsburgh. The Steel market continues extremely active and there is a scarcity in Bessemer and Open Hearth Billets, particularly of the latter. The Carnegie Steel Company is well sold up and is quoting $24 for Billets and $25 for Long Bars. Several of the smaller Steel plants have no Steel to spare, needing it all for their Finishing mills and to fill orders booked some time ago. In Finished Material tonnage is holding up very well and on Plates, Steel Bars and Structural Steel the mills are from two to three months behind in deliveries. A slightly better inquiry is reported for Sheets, but Tin Plate continues quiet. The Scrap trade is showing some betterment, but Coke continues dull. The general feeling is that demand will perceptibly increase this month and by September will be in full swing.

Ferromanganese.—There is some inquiry for small lots and we quote foreign 80 per cent. Ferro at $48.50, delivered, for large lots and $49 in carloads. A sale of 25 tons is reported at the latter price.

Rods.—The firmer position of the Steel market and the higher prices have had a sympathetic effect upon Rods, prices of which are showing a stronger tendency. We quote Bessemer and Open Hearth Rods at $32.50 and Chain Rods $33.50, maker's mill.

Steel Rails.—There has been great activity in the Rail trade in the past two weeks, all the mills having booked considerable tonnage and being well sold up to the close of the year. The Carnegie Steel Company has booked upward of 100,000 tons in the past two weeks and is turning out over 4000 tons a day at its Edgar Thomson and Youngstown plants. The Republic Iron & Steel Company has taken more orders and is said to have its Rail capacity sold up for the balance of this year. We quote Standard Sections at $28, at mill. The Rail mills being so well filled up on Standard Sections are now somewhat indifferent in getting business in Light Rails and prices on these are firmer. We quote at $23 to $25, depending on sections.

Skelp.—The market is very quiet and no important tonnage is being placed. Prices are largely nominal and we quote: Bessemer Grooved Skelp, 1.50c. to 1.55c.; Open Hearth, 1.55c. to 1.60c.; Sheared, $1 advance; Grooved Iron Skelp, 1.60c.; Sheared, 1.67½c. to 1.70c., maker's mill.

Plates.—Tonnage in Plates continues heavy and early deliveries on narrow Plates cannot be obtained inside of three or four months. Reports are that some heavy Steel car orders are soon to be placed, and if these materialize the Plate mills are reasonably sure of steady work the balance of this year. Prices are firm, but without change, and we are advised that reports of shading in prices of Plates are absolutely untrue. We quote: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—Conditions in the Structural trade are very active and a great deal of work is in sight. The fact that the Steel for the Manhattan Bridge at New York will be acid probably insures a portion of the tonnage coming to a local mill. All the mills are from two to three months behind in deliveries, and on small sizes of Beams and Channels, rolled from Open Hearth stock, are still further behind. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Inquiries for Sheets are said to be a little better, while prices have a stronger tone, due to the strong position of the Steel market. The Steel mills now quote $25 for Long Bars, and it is claimed that at this price there is little or no profit in rolling Sheets on the basis of 2.25c. for No. 28. The advance in Spelter has also affected Galvanized Sheets, which are firmer. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.10c. to 2.15c.; No. 26, 2.20c. to 2.25c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.30c. to 2.35c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.80c. to 2.85c.; Nos. 25 and 26, 3c. to 3.10c.; No. 27, 3.18c. to 3.23c.; No. 28, 3.40c. to 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 to $1.75 per square, and Galvanized Roofing Sheets, No. 28 gauge, at $2.85 to $2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—Reports are confirmed that the Implement trade has placed contracts for upward of 75,000 tons or more of Steel Bars, deliveries running through first half of 1906. This business was placed, we are advised, at the official price of 1.50c., which, however, is guaranteed against decline. General tonnage in Steel Bars is quite heavy, and specifications on contracts are coming in very freely. We quote Steel Bars at 1.50c., base, half extras, f.o.b. Pittsburgh, in carload lots and over. There is a

better demand for Iron Bars, and the mills are fairly well filled up. We quote at 1.55c. to 1.60c., Pittsburgh.

Hoops and Bands.—Specifications on contracts are coming in very freely, and new tonnage is also increasing. It is said that prices on Steel Hoops and Bands are being rigidly maintained. We quote Bands at 1.50c., with Steel Bar card extras, and Hoops at 1.65c., at mill.

Tin Plate.—Demand continues dull, and little new business is being placed. The production of Tin Plate at present is at a low ebb, some of the larger plants of the leading interest being idle and also a number of the outside mills. Stocks of Tin Plate have been decreased materially in the last few months, and are much lighter now than at any time this year. It is believed the demand will start in the latter part of this month or early in September, and indications are that it will be heavy, as the fruit crop promises to be large. We quote Tin Plate at $3.50 to $3.55, base, terms 30 days, or 2 per cent. off for cash in 10 days. Some of the jobbers who are still carrying fairly large stocks bought when the market was lower continue to shade this price 5c. to 10c. a box.

Merchant Steel.—This is the off season in the trade, and as a result the new tonnage being placed is light. The mills are fairly well filled with contracts on which buyers are specifying at a satisfactory rate. Prices given below are sometimes shaded. We quote: Flat Sleigh Shoe, 1.50c. to 1.55c.; Toe Calk Steel, 2c. to 2.05c.; Smooth Finished Tire, 1.65c. to 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Railway Spring Steel, 1.65c. to 1.70c.; Crucible Tool Steel, 5½c. to 8c. for ordinary grades; special grades, 12c. and upward. Shafting is in fair demand, discounts being 50 per cent. off in carloads and 45 per cent. in less than carloads. For delivery at certain competitive points these discounts are slightly shaded by one or two concerns.

Spelter.—The Spelter market continues very active and the recent advance in prices is being held. We quote Prime Western grades at 5.35c. to 5.40c., St. Louis, equal to 5.47½c. and 5.52½c., Pittsburgh.

Merchant Pipe.—The last week in July saw a slight improvement in the demand for Pipe in Merchant sizes and the mills have a comfortable amount of tonnage on their books. In the official list of discounts, which have been only nominal for some months, ¾-inch to 6-inch Pipe to consumers is given at 75 off, but actual prices to consumers are now on the basis of three points lower, or $6 a ton, and have been for some time. All the mills are now selling on this basis, with a further discount to the larger trade. These official discounts, the actual market being three points, or $6 a ton, lower to consumers, are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	67	51	65	49
⅜ and ½ inch	71	59	69	57
¾ to 6 inches	75	65	73½	63½
7 to 12 inches	70	55	68½	53
Extra strong, plain ends, ⅛ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong, plain ends, ⅛ to 8 in.	56	45	54	43

Boiler Tubes.—The tonnage in Boiler Tubes is larger than the mills can supply promptly, and as a result they are considerably behind in deliveries. Prices are firm and we are advised official discounts are being maintained. These are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	41	44
1¾ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 3 inches	53	64
6 to 13 inches	41	56

Coke.—There is practically no change in conditions in the Coke market, the demand being rather quiet both for Furnace and Foundry. A few small plants in the Connellsville region are closed and others are running four to five days a week. The ovens of the Frick Coke Company were operated full time last week. Last week out of nearly 30,000 ovens in the Upper and Lower Connellsville regions a little more than 4000 were idle, the total ouput of both regions being estimated at about 350,000 tons, a slight increase over the previous week. Strictly Connellsville Furnace Coke for August and September shipment is held at $1.80 to $1.85 and for fourth quarter at $2 to $2.10, at oven. Connellsville 72-hour Foundry Coke is held at $2.25 to $2.35 for this and next month's shipment, while for fourth quarter most operators quote $2.50, at oven. Main Line brands of Furnace Coke are quoted at $1.50 to $1.60 and Foundry at $1.90 to $2.10, at oven.

Iron and Steel Scrap.—There is a slight improvement in the demand for Scrap and dealers believe that early in September the mills will be in the market for a good deal of tonnage. Prices are stronger and there is less disposition to force material on the market, in view of the expected better prices later. Heavy Melting Scrap is very firm, the consumption being heavy on account of the open hearth steel mills being so busy. We quote Heavy Melting Scrap, $14.25 to $14.50; Bundled Sheet Scrap, $12.50 to $12.75; No. 1 Wrought Scrap, $15 to $15.25; Cast Iron Borings, $8 to $8.25; Wrought Iron Turnings, $12.50 to $12.75; Cast Steel Scrap, $14 to $14.25; Old Steel Rails, short pieces, $14.25 to $14.50; long pieces, $14.50 to $14.75, all in gross tons delivered, Pittsburgh.

Philadelphia.

REAL ESTATE TRUST CO. BUILDING, August 1, 1905.

The Iron trade has maintained its improving tendency, and while it has been very gradual, it is none the less distinct. Those who can buy Foundry or Mill Irons at last week's prices are regarded as specially favored, although at 25c. advance buyers can get all they want for this and next month's delivery. Contracts for long dates, however, are not sought after unless at some advance on ordinary quotations. The situation is, therefore, what may be called stubbornly strong. Makers of Iron are not trying to push sales or to advance prices, the idea being that the market can take care of itself and will be the better for being allowed to do so. The demand is not unusually heavy, but it takes up the slack, although, of course, sellers protect their trade when it becomes necessary to do so. Consumption keeps on at an increasing rate, and as many contracts for Pig Iron expire within the next 30 to 60 days buying must be on an extensive scale. This may consist of small lots, frequently taken, or large lots to replace contracts running out during the next month or two, but the character of the buying at the present time appears to indicate a conservative attitude all the way through. Consumers are feeling their way along, and makers are doing pretty much the same thing. If the current output is inadequate to meet requirements 25c. to 50c. advance in price will increase the supply, and so on with every additional advance. No living man can say for certain how much Pig Iron will be melted during the next eight or ten months; neither can any one say what the range of prices will be, although 2,000,000 tons per month would probably hold quotations within 50c. to $1 per ton of to-day's figures. Prices are less liable to go on the rampage than they were a few years ago, however, consumers having become impressed with the idea that the capacity for supply is equal to almost any emergency, because when prices get beyond a certain point the supply increases as if by magic, and when it reaches the point of excess they soon lose their buoyancy and reaction begins. The lesson has been well learned, and while there are good and sufficient reasons for expecting the largest business the country has ever known, it is not improbable that it will be done at more uniform prices than during any former period of great business activity. The demand for the more advanced products indicates an early improvement. There are inquiries for important tonnages of Billets and Muck Bars, and these in turn have led to inquiries of corresponding tonnages of Pig Iron. Nothing definite has been reported in the way of sales, but it is almost certain that a great deal of business will be forthcoming in the near future, which will be so much clear gain, as all other departments are either holding their own or making increases. Prospects are therefore exceedingly satisfactory, and with the maturity of the corn crop without serious injury there appears to be nothing to prevent the development of exceptionally prosperous conditions.

Pig Iron.—The demand for Pig Iron is increasing, and judging from the many inquiries that are being made sales during the next week or two will be very heavy. The tonnages called for are not large individually, although lots of 1000 to 5000 tons each are occasionally met with, but sales thus far have been in 100 to 500 ton lots, as buyers are taking only such quantities as they are likely to need within the next 30 to 60 days. Prices are a little dearer than they were a week ago, and as the undertone is strong it is not unlikely that the advance will go somewhat further, but the conservative character of the buying shows that the speculative element is kept pretty well to the rear. It is difficult to quote prices that will cover all the sales, circumstances being so varied that hardly any two transactions are on the same basis. One brand may be more in favor than another, or the buyer may be located at a competitive point, or he may have a claim for favorable consideration, or he may have had an option at a low price, any of which may bar the transaction from being a fair quotation, unless all particulars are given, which is obviously out of the question. Covering such conditions, No. 2 X Foundry has been sold at from $16.25 to $16.75, and Gray Forge at $14.50 to $15. A fair average in both cases would be about $16.50 and $14.75. Basic has been sold at $15, but standard makes are quoted at $15.50, although some stock which is a little high in sulphur is still available at about $15. A fair average of prices, however, for Philadelphia and nearby points would be about as follows:

No. 1 X Foundry	$17.25 to $17.50
No. 2 X Foundry	16.25 to 16.75
No. 2 Plain	15.75 to 16.00

Standard Gray Forge	14.75 to 15.00
Basic	15.00 to 15.50
Low Phosphorus	20.25 to 20.50
Southern No. 2 X, rail	15.50 to 16.00
Southern No. 2 X, on dock	15.00 to 15.50
Southern Gray Forge	14.50 to 15.00

Ferromanganese.—The market is easier and purchases could be made at about $46, on dock. The fears of scarcity on account of foreign complications, strikes, &c., appear to have disappeared; hence the willingness to accept lower prices.

Muck Bars.—There is more inquiry and buyers are said to be willing to pay about $27, f.o.b. maker's mill, which is about $1 per ton below the seller's price.

Steel.—Makers of Steel expect a scarcity in the near future. They are already well supplied with orders, but so many inquiries are coming in for additional quantities that they are disposed to be very firm. Prices, however, are about $26.50 for Open Hearth Steel, and for small lots something better has to be paid.

Plates.—The market has been somewhat quiet during the past few days and some of the mills could handle a larger volume of business if they had it in hand. Prospects appear to be satisfactory, but the immediate situation is not quite up to expectations. Prices remain unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under	1.63½	1.68½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100 pounds extra.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G	.15 "
No. 9, B. W. G	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—There is no change in this department in which business is in a highly satisfactory condition. Mills get orders for all the work they can turn out, and in many cases have weeks and months in which no deliveries can be promised for certain specifications. Prospects are excellent and prices firm as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—The demand for Bar Iron is improving, and while there is no difficulty in placing orders for reasonably prompt shipment the mills are beginning to fill up with new business. Prices firm at 1.63½c. for either Refined Iron or for Steel Bars.

Sheets.—The demand is somewhat disappointing, although the mills are running full, but there is not as much inquiry for forward delivery as was expected. Prices unchanged as follows: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Old Material.—The market is not as strong on Steel Scrap as it is on Iron, although there is no quotable change in prices. Buyers are taking the latter at full or a little better prices, while they are not bidding quite as much on Steel Scrap as they did a week or two ago. Bids and offers delivered in buyers' yards are about as follows:

Scrap Steel Rails	$16.00 to $16.25
No. 1 Steel Scrap	15.50 to 16.00
Old Steel Axles	19.00 to 19.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	18.50 to 19.50
Old Car Wheels	15.00 to 16.00
Choice Scrap, R. R. No. 1 Wrought	17.00 to 18.00
No. 1 Yard Scrap	14.50 to 15.00
Long and Short	13.50 to 14.00
Machinery Scrap	14.00 to 14.50
Wrought Iron Pipe	13.00 to 13.50
No. 1 Forge Fire Scrap	13.00 to 14.00
No. 2 Light, Ordinary	10.00 to 11.00
Wrought Turnings	12.00 to 12.50
Axle Turnings, Choice Heavy	13.00 to 13.50
Cast Borings	8.50 to 9.00
Stove Plates	11.00 to 11.25

The Simonds Mfg. Company, Chicago, informs us that it will furnish without charge to interested parties blue prints of the working drawings of the coal conveying apparatus described in *The Iron Age* of July 13. This plant was built entirely from designs created by the engineers of the Simonds Company. The firm does not build the apparatus nor sell any part of it, as it is engaged solely in the manufacture of saws, but it offers this information for the good of the cause.

A New Structural Mill for Clairton.

W. E. Corey, president of the United States Steel Corporation, when in Pittsburgh last week decided upon the building of a new structural mill at the Clairton Works, which are equipped with blast furnaces, a basic open hearth steel plant and a 40-inch blooming mill. The latter is in a position to roll the blanks for the new 22-inch shape mill. The heavy blanks will be heated in three continuous heating furnaces. The mill is to roll the range of 4 to 8 inch beams and channels and 6 x 6 inch angles, and will have a capacity of 10,000 tons per month of shapes. The improvement will cost about $350,000.

The extraordinary feature in connection with the new mill is the fact that it is to be completed in 13 weeks, the local management guaranteeing that remarkable achievement. Some of the machinery will be taken from other plants of the Steel Corporation; thus the engines will come from Sharon and the housings and shoes from the Shoenberger works. Contracts for the machinery are probably let at this writing, and the work of breaking ground was begun on Saturday last.

PERSONAL.

J. R. McColl, who was until the close of the last college term associate professor of steam engineering at Purdue University, has decided to take up commercial lines and has accepted a responsible position in the engineering department of the American Blower Company at Detroit.

George H. Lowe, who was formerly with the Pullman Company at Pullman, Ill., and with the Sligo Iron Company at Connellsville, Pa., has taken charge as superintendent of the works of the Highland Iron & Steel Company, maker of merchant bars and rolled shafting at South Portland, Maine.

Charles McCrery of the Woodward Iron Company, Woodward, Ala., expects to sail on August 9 for a several months' trip abroad.

Bruno Poensgen, a well-known German tube manufacturer, has returned home after a visit to this country extending over several months.

Simon Guggenheim of the American Smelting & Refining Company has given $75,000 to the Colorado School of Mines at Golden.

The Alaska party of the American Institute of Mining Engineers has returned from a very successful trip to British Columbia and the Klondike. Among the members were Capt. Robert W. Hunt of Chicago, B. F. Fackenthal, Jr., of Easton, Edgar S. Cook of Pottstown, J. P. Pardee of Hazelton, Walter Wood, E. V. D'Invilliers and W. S. Pilling of Philadelphia; E. L. Ford of Youngstown and Dr. R. W. Raymond, John C. Kafer, Dr. Struthers and Theodore Dwight of New York.

George L. Fairbank has been elected vice-president of the Struthers Furnace Company of Cleveland and Struthers, Ohio, in the place of J. B. Stubbs, who has resigned. Albert Grossman has been elected secretary, and now fills both offices of treasurer and secretary.

Alexander K. Hamilton, chief engineer of the Lackawanna Steel Company, Buffalo, N. Y., has resigned, effective August 1. Charles J. Barr has been appointed chief engineer and mechanical superintendent to succeed him.

George Nash, superintendent of the plant of the Pittsburgh Steel Company, Monessen, Pa., has returned from Europe.

Paull J. Challen, assistant to the manager of the Green Fuel Economizer Company, has recently accepted a position with the Stirling Company at its Philadelphia office. Mr. Challen has been connected with the Green Fuel Economizer Company since it started manufacturing in this country, 13 years ago. As designing and constructing engineer he has had a large experience and opportunity to study various types of boilers and their operation.

New Publications.

Electric Smelting and Refining. By Dr. W. Borchers. Translated from the third German edition, with additions, by Walter G. McMillan. 8vo. Pages, 562. Illustrations, 259. Publishers: Charles Griffin & Co., London; J. B. Lippincott Company, Philadelphia. 1904. Price, $7 net.

The first English edition of Dr. Borchers' well-known manual was brought out in 1897. This second English edition embodies much new matter. In view of the marked progress made in electro-technology since 1897 a large part of the original volume required to be rewritten. As the present edition was going through the press the death of the translator, Mr. McMillan of the Metallurgical Department of Mason College, Birmingham, and author of a "Treatise on Electro-Metallurgy," deprived the work of his final revision, but this was taken up by others. The extraction and treatment of metals by means of the electric current constitutes a field in which much ambitious work has been done in the United States and on the Continent of Europe. Great Britain thus far has not kept pace. The publication of a number of works dealing with the newer theories of electro-chemistry led the author to omit the introductory sketch which appeared in the first edition. The omission illustrates the rapid development of electro-chemical research. Part 1 deals with Alkalies and Alkaline-Earth Metals, Part 2 with Earth Metals and Part 3 with Heavy Metals. The chapters in the last part deal in turn with copper, nickel, silver, gold, zinc and cadmium, mercury, tin, lead, bismuth, antimony and vanadium, iron, carbides and silicides, with a combination chapter on chromium, molybdenum, tungsten, uranium and manganese. The chapter on iron consists of 18 pages, being scarcely as full as might be desired. However, the furnaces best known in connection with the electrical production of crude iron, malleable iron and mild steel are illustrated and described.

The Stassano pig iron process and Héroult's, Harmet's and Keller's processes for the production of crude iron are described briefly, the two last named being illustrated. In discussing the electrical production of malleable iron and steel the author treats briefly of the Siemens furnace, illustrates the De Laval and describes at some length the Héroult furnace, giving a full plate illustration of the latter in operation. The Kjellin method of generating the heating current within the metal itself by induction is described and some details are given of the operation of this furnace at Gysinge, Sweden. With a new 300 horse-power furnace it is stated that Kjellin hopes to produce 44 pounds of steel per electrical horse-power in 24 hours. Referring to the Stassano process as carried out at Darfo, Italy, the author says that it depends for its success on particularly favorable conditions with regard to cheapness of power and purity and cheapness of raw materials. The processes of Héroult and Kjellin he regards more generally applicable for existing blast furnace plant. Their success is not dependent on cheap water power, the waste gases from coke ovens and blast furnaces forming a useful and abundant source of cheap current. The output of from 40 to 44 pounds of mild steel, which the author credits to the Héroult and Kjellin processes, per electrical horse-power in 24 hours could undoubtedly be increased, he says, in larger plant, and adds: "Seeing, however, that the charge is already in a molten or semi-molten condition when introduced into the electric furnace, it is evident that the cost of heating by electricity can no longer stand in the way of the production of steel by this means and that the iron industry is in a position to make increasing use of the advantages of electric heating." Stassano's estimate of the cost of production in a 5-ton plant, capable of turning out 30 tons of mild steel in 24 hours, is 94 lire, or about $18. It has to be said in this connection, however, that the electrical process for iron and steel has not as yet been sufficiently attractive to enlist capital on any scale.

In his chapter on metallic compounds, carbides and silicides the author describes the furnace of the Willson Aluminum Company, which has a portable and tipping hearth, also the Clarke furnace and that of Kiliani. He considers the new Héroult furnace particularly suitable for the preparation of silicides, and says that nearly all the tap furnaces used in carbide making and metal smelting can be employed for the same purpose. A study of the book is calculated to impress the reader with the great amount and the excellent character of the work under way in the field of electro-metallurgy. But as for the electric current becoming an important commercial factor in the production of iron and steel, that is a consideration that seems now quite remote.

Proceedings of the Tenth Annual Convention, National Association of Manufacturers. Edited by Marshall Cushing, secretary. Pages, 320.

Issued two weeks earlier than in any previous year and containing one-half more than any similar record, this pamphlet contains the addresses, reports and discussions of the Atlanta convention of the National Association of Manufacturers, held May 16, 17 and 18. Some important committee reports were presented at that convention and the book just published becomes an interesting contribution to the literature of several subjects on which American manufacturers have been doing some hard thinking in the last two or three years.

The Automobile Pocket Book.—A compendium of the gasoline automobile. By E. W. Roberts, M.E., member of American Society Mechanical Engineers. Publisher, the Gas Engine Publishing Company, Cincinnati, Ohio. Size, 3½ x 5¼ inches. Limp leather binding. Pages, 319; illustrations, 52. Price, $1.50.

This is a new book on automobile operation and construction by the author of "The Gas Engine Handbook," and is intended to be a standard reference for those interested in the design or operation of gasoline automobiles. The matter contained has been compiled after consulting a number of manufacturers on the parts dealt with and studying the books issued by various automobile companies. It is made as concise as possible and deals only briefly with the engines, inasmuch as the other handbook by the author goes very fully into the subject. Technical terms and language have been avoided as far as consistent, to make it intelligible to the average reader, but it is at the same time not too elementary to be of value to the expert. Following a brief introductory chapter on the principles of four and two cycle gasoline engines, the writer gives a discussion on the fuel, devices for its mixing, ignition, care of the electrical apparatus, systems of speed control, valve mechanism, starting and stopping and lubricants. The practical handling of the engine is covered in the next few chapters, under the headings Care of the Engines, Engine Troubles, Engine Testing, Cooling Devices and Mufflers. The next general subdivision concerns transmission systems and construction and working of the parts entering into chassis. The concluding chapters are largely in the nature of suggestions for the care and running of automobiles. Useful points are covered with regard to emergency repairs, and one chapter is devoted to "Dont's," telling what to avoid. The last chapter will appeal directly to intending purchasers as it gives points to observe when choosing a car.

In the operation of controllers, which are employed for varying the active lengths of the windings of transformers from which alternating current motors are supplied with variable voltage, dangerous and destructive arcs are produced by the temporary short circuiting of portions of the main transformer windings when changes in voltage take place. To provide against this a recent patent makes use of an auxiliary transformer having a single primary and either one or two secondary windings. This is switched into and out of the circuit at such positions with relation to the main notches on the controller that its impedence chokes down the amount of current in a locally interrupted circuit—that is, its electromotive force opposes and balances that which would otherwise produce an arc.

The Machinery Trade.

NEW YORK, August 2, 1905.

Though fairly good for this time of the year the machinery trade is not nearly so brisk as it has been. There are plenty of inquiries that give promise of early development in the market, but closings are rather scarce, indicating that buyers intend to hold off for a few weeks. Merchants generally speak of the present lull as natural and intimate that it will be followed by a volume of business equal to that in the spring, at which time many concerns have experienced their best trade for the past two years. It has been evident for the past year that the demand for machinery is increasing, and from the many developments along mechanical lines, opening up new uses for tools and necessitating the designing of new tools, there is little doubt but that the machinery business will continue to expand very materially.

A short time ago we referred to the beneficial effects upon the machinery trade of the general use of high speed steel and the new uses for which certain tools were being applied. One class of machinery whose field of operations is constantly enlarging is grinding machinery, which is being used more and more to do the work formerly done by other tools. Many castings and machine parts which were heretofore turned by a lathe are now being ground because of the more accurate and smoother surface produced. The growth of the automobile industry has also been an important factor in extending the sales of grinders. As a consequence the sales of emery wheels show a marked increase. One of the largest manufacturers of emery wheels reports 50 per cent. more business the past year than the one previous.

The many uses to which sheet metal is being put has also increased the demand for metal working machinery. The variety of articles that can be made from sheet metal is growing rapidly and engineers who have an aptitude for designing special machinery have had plenty to do, as there is a constant demand for new machines of special designs calculated to do certain work on some new output of the metal goods plants. This is particularly true with machinery dealers who make sales to metal furniture manufacturers, as the latter people are constantly making metal furniture of new design and naturally are regularly in need of new special machinery to turn out their work.

The plan of the August Belmont interests to open the old Steinway tunnel under the East River at Forty-second street has by no means been abandoned as a result of the failure of the plan to modify the terms of the franchise by legislation, and it is probable that before long the Interborough Company will take steps toward constructing the tunnel in order to establish direct connections between the Manhattan Subway and the Queens County trolley lines. It was in furtherance of that scheme that all the important traction lines in the western end of Long Island were merged into a company controlled by Interborough and Pennsylvania Railroad interests.

The American Supply and Machinery Manufacturers' Association.

This association, which was organized by the honorary members who attended the session of the Southern Supply and Machinery Dealers' Association at Savannah, Ga., last April, has now been thoroughly formed, and offices were established last month at 309 Broadway, New York, with F. D. Mitchell, the secretary-treasurer, in charge. While the association was originally formed for social reasons the idea has grown until now it is the purpose of the organization to keep in touch with the trade and look out for the manufacturers' interests as well as to promote good feelings between the manufacturer and dealer. An announcement was sent out to numerous manufacturers of machinery and supplies on June 20 telling of the formation of the organization and inviting them to join. The announcement explained that the former honorary membership of the Dealers' Association has been abolished, and included in the epistle was a circular letter from John G. Christopher, president of the Southern Supply and Machinery Dealers' Association, advising manufacturers to file applications for membership with Mr. Mitchell. As a hint to the trade that the principal object of the organization will be to look out for the manufacturers' interests the following was embodied in the announcement:

> Doubtless you have noted with interest the recent formation of a National Supply and Machinery Dealers' Association, and are more or less familiar with the efforts making looking to the organization of sectional dealers' associations in various parts of the country, and may have already received communications carrying recommendations as to the methods which you should use in the distribution of your products. The formation of a manufacturers' association follows naturally; without binding any of its members to any definite agreement or plan, yet the American Supply and Machinery Manufacturers' Association provides, through its advisory board and otherwise, the "machinery" whereby the evils or unsatisfactory conditions of trade may be modified, and in some cases eradicated, which its members acting separately and alone would be helpless to oppose.

An annual membership fee of $25 will be charged to provide revenue to cover the expenses of the organization, which has elected the following officers for the ensuing year: President, Edward C. Hinman, American Steam Pump Company, Battle Creek, Mich.; first vice-president, M. W. Mix, Dodge Mfg. Company, Mishawaka, Ind.; second vice-president, Charles F. Aaron, New York Leather Belting Company, New York; third vice-president, John J. Voorhees, Voorhees Rubber Company, Jersey City, N. J. Executive Committee: Samuel L. Moyer, chairman, Lunkenheimer Company, Cincinnati, Ohio; S. P. Browning, Ohio Valley Pulley Works, Maysville, Ky.; N. A. Gladding, E. C. Atkins & Co., Incorporated, Indianapolis, Ind.; Charles P. King, American Iron & Steel Mfg. Company, Lebanon, Pa.; Joseph H. Grubb, Hussey-Binns Shovel Company, Pittsburgh, Pa.; secretary-treasurer, F. D. Mitchell, 309 Broadway, New York. Advisory Board: Samuel L. Moyer, Lunkenheimer Company, Cincinnati, Ohio; N. A. Gladding, E. C. Atkins & Co., Incorporated, Indianapolis, Ind.; M. W. Mix, Dodge Mfg. Company, Mishawaka, Ind. The companies represented in the association so far are:

Dodge Mfg. Company, Mishawaka, Ind.
American Steam Pump Company, Battle Creek, Mich.
American Iron & Steel Mfg. Company, Lebanon, Pa.
E. C. Atkins & Co., Indianapolis, Ind.
Bradford Belting Company, Cincinnati, Ohio.
W. L. Brubaker & Bros., Millersburg, Pa.
Buffalo Forge Company, Buffalo, N. Y.
Adam Cook's Sons, New York City.
Crescent Machine Company, Leetonia, Ohio.
Detroit Oak Belting Company, Detroit, Mich.
Diamond Saw & Stamping Works, Buffalo, N. Y.
Eureka Fire Hose Company, New York City.
Gandy Belting Company, Baltimore, Md.
Gardner Governor Company, Quincy, Ill.
Keasbey & Mattison Company, Ambler, Pa.
La Belle Iron Works, Steubenville, Ohio.
Lunkenheimer Company, Cincinnati, Ohio.
McRae & Roberts Company, Detroit, Mich.
Mount Vernon Belting Company, Baltimore, Md.
New York Leather Belting Company, New York City.
New York Belting & Packing Company, New York City.
Ohio Valley Pulley Works, Maysville, Ky.
Ohlen & Sons Saw Mfg. Company, Columbus, Ohio.
Paul Mfg. Company, Fort Wayne, Ind.
Penberthy Injector Company, Detroit, Mich.
Pennsylvania Shafting Company, Spring City, Pa.
Pike Mfg. Company, Pike, N. H.
Reeves Pulley Company, Columbus, Ind.
Clement Restein & Co., Philadelphia, Pa.
Saginaw Mfg. Company, Saginaw, Mich.
Trinidad Asphalt Mfg. Company, St. Louis, Mo.
Union Steam Pump Company, Battle Creek, Mich.
Voorhees Rubber Mfg. Company, Jersey City, N. J.
Western Block Company, Lockport, N. Y.
T. B. Wood's Sons, Chambersburg, Pa.
New Jersey Car Spring & Rubber Company, Jersey City, N. J.
John Davis Company, Chicago, Ill.
Peerless Rubber Mfg. Company, New York City.
Detroit Lubricator Company, Detroit, Mich.
Wm. Powell Company, Cincinnati, Ohio.

Railroad Notes.

The Denver & Rio Grande Railroad is preparing plans for a 50-stall roundhouse and repair shop to be erected at Pueblo, Col. It is also said that the company expects to build a large machine shop as well as a plant for the manufacture of switches, frogs and other track equipment, and a plant may be built for the manufacture of cars. The plans for the proposed improvements have not been entirely prepared as yet and it is understood that none of the equipment has been bought. All the purchasing will be done from Denver or Pueblo, and the engineering force at the latter place has charge of the details. It is understood that the company is preparing to build another roundhouse somewhere along its line at an expense of $250,000. It is not known as yet whether any orders for machinery will be placed through the New York office, although this company has in the past patronized the New York market somewhat when making purchases for the West.

The Pennsylvania Railroad purchasing department has been making some scattered inquiries in the market for machines of various types. It is understood that the machines are wanted for the Altoona shops. A large number of purchases of equipment were made during the past week against the lists of machine tools printed in these columns during the last few months.

We understand that the $20,000 list of machine tools sent out recently by the Brooklyn Rapid Transit Company for equipping its new shops in East New York will not be closed for some weeks, as the bids are to be tabulated and submitted to the officials for their approval. A short time ago the company purchased a few machines, but these were not covered by the list. As it is the intention to have the new shops completed and ready to receive the machinery in the fall it is not expected that all of the tools will be bought before that time.

Contracts will shortly be given for constructing the concrete elevations in New York for the Westchester County system of the New York, Westchester & Boston Railroad Company, and it is expected that before the summer is over most of the railroad will be laid. William A. Pratt, chief engineer of the company, who has offices at 30 Broad street, has not taken up the details of the machine shop and power house construction as yet, but it is thought that before long that part of the project will be gotten under way. Plans will be prepared for a power station, in which 15,000 kw. of power will be used, and three converter stations will be constructed as well as a machine shop and a repair shop. The railroad company has made no announcement as to where the power station and other structures will be

erected, probably because it might be found difficult to get property at a reasonable price if any intimation is given as to where the structures are to be located. No machinery has been purchased as yet for the power house or machine shop, and it is said that the details of that matter will not be gone into for some time yet.

The Havana Central Railroad Company, which has been purchasing quite extensively in the New York machinery market of late, is carrying on a large railroad project in Cuba. The company is building a network of electric railroads from the city of Havana to outlying towns, and is laying 120 miles of single track. The line will be for freight and passenger service, and it is the purpose of the company to transport perishable products to Havana, where a dock is being constructed by the company. Heretofore the fruit has been carried into Havana by wagon, and then transported in boats to steamers, because the harbor was too shallow to admit docking large sea going vessels. When the harbor has been dredged and the dock constructed machinery will be secured for handling and unloading the freight from the cars to the steamer. The company has bought 12 General Electric Company locomotives and a power house, machine shop and car building plant are being built. The details of construction are in charge of G. F. Greenwood, chief engineer of the company, who is at Havana superintending the operations. He is in charge of all the purchasing and is doing the buying from there. The company has offices at 52 Broadway, New York, and C. W. Van Voorhis is secretary and treasurer of the concern, while Lawrence Turnure & Co. of 50 Wall Street, New York, are the financial agents. It is said that the company has other plans for improvements in Cuba, and later on will engage in additional construction projects.

Machinery Requirements.

In view of the large business machinery dealers of this country expect to do with Japan, the visit at this time of F. W. Horne of Yokohama, Japan, who is the largest machinery dealer in that country, and who represents a great many American manufacturers, is of considerable significance. Mr. Horne has been for the past couple of weeks and is now in this city, making his headquarters with the Niles-Bement-Pond Company, Trinity Building. We understand that he is visiting the machinery trade.

The Ruggles-Coles Engineering Company, 39 Cortlandt street, New York, has a contract for constructing and equipping a mill for the Niagara Cement Company, which has been incorporated with $150,000 capital stock, to manufacture cement from blast furnace slag. The plant, work on which will be begun shortly, will cost $100,000, and it will adjoin the works of the Buffalo Union Furnace Company. Plans are now being completed for the structure and as yet none of the machinery equipment has been purchased. Later on the Ruggles-Coles Company will buy 500 horsepower of boiler and engines, besides tube mills and other machinery for the mill. Ruggles-Coles dryers will be installed and the equipment of the mill will be much similar to that of the Ashland Slag Cement plant described last week in *The Iron Age*. The officers of the new company are: William B. Ruggles of New York, president; John P. Seymour of New York, vice-president and general manager; William B. Reading, Buffalo, treasurer, and C. A. Collins, secretary.

The Bernstein Mfg. Company, Third street and Allegheny avenue, Philadelphia, Pa., which is to erect a new foundry across the street from its main building, will be in the market for an electric traveling crane, cupola and separator for sorting the iron from slag. As the company has sufficient power no additional boilers will be required.

If the present plans of Rhodes, Curry & Co., Amherst, Nova Scotia, are carried out it is likely that they will come into the market for quite a lot of new machinery. The company recently equipped a building as a planing mill, but is looking forward to converting this into a plant for the manufacture of steel freight cars.

The Globe Boiler Compound Company, Binghamton, N. Y., which was recently incorporated with a capital stock of $10,000, has established a plant for the manufacture of a boiler compound which it is claimed will clean boilers and prevent the formation of scales. As the company's business is increasing rapidly, it intends to put in some new machinery, such as engines, boilers, grinding machines and other apparatus necessary for the full equipment.

The Riverside Iron Works, Charleston, S. C., has purchased a wharf adjoining its plant, together with other property, with the idea of engaging more largely in the shipbuilding industry, and when a lease now held by another concern on the wharf property expires, as it will on January 1 next, the wharf will be rebuilt. The company is also preparing to construct a new railway large enough to take a vessel with a keel of 175 feet. The present cradle, which is 100 feet long, will be lengthened 75 feet. No new machinery will be bought before the company acquires possession of its new property.

Besch & Beebe, Arcade Building, Utica, N. Y., have been awarded the contract to construct an intersecting sewer for the city of Utica. This work will be of concrete 5000 feet long and the contractors are in the market for concrete mixing machines and a pile driver.

A project which will result later on in some machinery purchases is that of a number of capitalists to engage in the manufacture of castings. The United States Metal Chill & Casting Company has been organized with a capital of $5,000,000, and while the plans of the new concern have not been entirely formulated as yet, it is expected that a factory will be erected somewhere near New York. The incorporators are James Sayers, Thomas W. Duane, Edward A. McCann, Isaac Beers and Samuel Schwarz. Mr. Duane has an office at 280 Broadway. It is understood that the company will be thoroughly organized within a short time and then arrangements for manufacturing will be begun.

The Standard Concrete Steel Company, New York, which was recently organized to take over the business of the Guy B. Waite Company and carry on a general fireproof construction business, has absorbed the business of A. J. Redway & Co. of Cincinnati, Ohio. The Redway Company has been engaged in the erection of concrete structures as well as contracting for the insulation of icehouses, abattoirs and cold storage plants. The company has had contracts for the erection of a number of large cold storage plants, and it is understood that the Standard Concrete Steel Company will shortly enlarge its concrete plant at Thirty-first and Thirty-second streets and the East River, New York. No definite plans to that effect have been made as yet, but it is the policy of the concern to expand largely within the next few years and perhaps other plants will be built in the future. The company has an office at 100 Broadway, New York, and an office has also been established at Cincinnati.

It is likely that the Fagan Iron Works, Jersey City, N. J., will soon have to purchase considerable machinery to replace that lost in the fire which burned the greater part of its plant on Tuesday night. The loss is said to be $100,000. A building similar to the one burned Tuesday was destroyed by fire about two months ago and is in process of rebuilding.

Col. Michael J. Dady of Brooklyn, N. Y., has secured the contract to rebuild the pumping station of the Brooklyn water supply system at Massapequa, L. I., at his bid of $327,850.

The Department of Water Supply, Gas and Electricty of New York will open bids on Wednesday, August 16, for furnishing four water tube boilers at the new Ridgewood pumping station. Bids will also be opened for erecting a temporary pumping plant at the same station and for a pumping engine, with appliances complete, at the Gravesend station, besides two boilers and one economizer.

Business Changes.

The Ingersoll-Rand Company took possession of its new offices on the fourteenth floor of the Bowling Green Building, 11 Broadway, New York, August 1. At that time the offices of the Ingersoll-Sergeant Drill Company at 26 Cortlandt street and the Rand Drill Company at 128 Broadway were given up and the united forces moved to the new offices.

Naylor Bros., engineers, founders and machinists, of Peekskill, N. Y., have opened a branch office at 136 Liberty street, New York.

New England Machinery Market.

WORCESTER, MASS., August 1, 1905.

It makes a good deal of difference to dealers in many lines of metal goods in New England whether the crop conditions of the six States are good or bad. This year promises to be an even better year than last year and the year before, according to the reports that have been received by State boards of agriculture. The hay crop is good in most sections of the State, though in some places the crop was short because of early drought. But potatoes, corn and other cereals and the general run of farming "truck" are all in good condition, and while it is the off year for apples, there is prospect of comparatively good yields. In Connecticut there is worry over lack of rain, which threatens the tobacco crop, but no damage has been done as yet. Other sections received timely rainfall in the form of fierce thunder storms and a period of continued wet weather early in the summer, and this, coupled with the great heat that followed, produced the best of conditions. Last year was a good one with the New England farmers and this year promises to be even better. This means much in many lines, as the dealers realize, and of course whatever helps the dealers help the manufacturers not only in New England but in the country as a whole.

The effort is being made to unite the independent shoe machinery manufacturers into one great company to act in competition with the United Shoe Machinery Company, which was itself the result of the merger of a number of independent companies. The headquarters of the new movement is at Lynn, Mass. No announcement has been publicly

made of the venture and no details are available. But it is generally believed that the effort is more than a tentative one and that a good deal has been accomplished toward making it a success so far as consolidating the independent interests is concerned. It is said that the time is now ripe for the fulfillment of a plan which has long been under consideration, because of the approaching expiration of certain important base patents. Shoe manufacturers cherish a certain amount of sympathy for the new project, because it will mean competition of a sort that does not exist to-day. In fact, a committee of the National Association of Boot and Shoe Manufacturers is at present investigating conditions of the shoe machinery market of the United States. If this plan of the independents goes through existing shops will not be adequate for the purpose of manufacturing machinery. The independent companies are generally small and their shops are not equipped for work on a large scale. Consequently the fulfillment of the plan would mean the erection of large shops, presumably in New England, which is the home of the shoe machinery business, and these shops would have to have new equipment if they would compete successfully with the magnificent plant of the United Shoe Machinery Company recently completed.

The Novelty Turning Company, Fitchburg, Mass., variety wood turn and enameler, will soon be in the market for an engine of from 30 to 40 horse-power, a boiler of from 40 to 50 horse-power and several variety wood turning lathes. The company has abandoned its Fitchburg shop and moves to Norway, Maine, where it is expected that it will be manufacturing by September 15 in what is known as the Steep Falls Mill. B. F. Brown and W. C. Brown make up the company.

The Hendee Mfg. Company, Springfield, Mass., manufacturer of motor cycles, has outgrown its present quarters and is looking for a larger shop. If one can be found in Springfield the business will stay there, otherwise it will be moved to some other city, Hartford and New Britain being under consideration. As soon as the matter of location is determined the company will require a considerable number of new machine tools.

It is proposed that a hippodrome be built in Boston to cost, according to the report, $2,000,000. No definite announcement has been made, however, though it is considered that there is considerable likelihood that the plan will go through.

There is a hitch in the plan to connect Boston and Cambridge by a four-track subway. Provision for the undertaking was made by act of the last Massachusetts Legislature, but with the proviso that the bill be subject to the approval of the Boston Elevated Railway Company, which would operate the line should the subway be built. The trouble lies in the cost. When the bill passed the Legislature it was expected that the cost of the subway would not exceed $5,000,000. There had been no time for a careful estimate. Since then the Elevated has given the matter a searching investigation, with the result that it is considered quite probable that the cost would be nearly if not quite $10,000,000, which the company does not think it prudent to expend. A 20-year tenure is included in the bill, which is too short from the company's point of view, considering the great cost. If a 40-year franchise should be granted doubtless the undertaking would go through. As it is it is possible that the city of Cambridge will undertake to bear a part of the expense rather than to have one of the Elevated's alternative plans carried out of a two-track subway or an elevated system. The matter will be threshed out very thoroughly before a decision is reached.

Chicago Machinery Market.

CHICAGO, ILL., August 1, 1905.

The machinery trade is noting with a good deal of satisfaction that business is suffering less from the usual midsummer vacation than in past years. The volume of business being done in spite of the fact that so many buyers are taking their vacations is looked upon as indicative of an unusually heavy business when industrial affairs shall have resumed their normal activity at the close of the heated term. Inquiry is excellent and a very good volume of business has been closed during the past week, the largest buyer being the Dake-American Steam Turbine Company of Grand Rapids, Mich., which bought a heavy equipment of machine tools. The International Harvester Company, the Ajax Forge Company, B. F. Sturtevant & Co.'s Chicago branch and others have bought liberally during the past week. The American Radiator Company is in the market for a heavy boring machine, but as far as can be learned this has not been placed.

A new union passenger station will be erected on Polk street, between Dearborn and Clark streets, occupying the present Dearborn station and a tract equally as large just west of it. This station will be occupied by the same five roads that enter the Dearborn station and possibly others. The deal was perfected by the Chicago & Western Indiana and the Wabash railroads. The land cost $1,500,000, and it is expected that at least an equal amount will be expended in the erection of the new union station. The Western Indiana is making rapid progress in the elevation of its right of way within the city of Chicago and within a year will have its entire system elevated up to the new terminal. As far as can be learned the architects and engineers for the new station have not yet been selected.

The Bay City Alkali Company has been organized at Bay City, Mich., with a capital stock of $800,000. A $600,000 plant will be erected, whose main building will be 100 x 350 feet. The company expects to be in the market in a few weeks for six 250 horse-power boilers, six large air compressors, a number of good sized pumps, cast cylinders, steel tanks and steel frame work for construction. John Faulkner, Bay City, is the company's engineer.

A contract has been secured by the Minneapolis Steel & Machinery Company, Minneapolis, Minn., to build a Corliss engine to furnish power for one of the largest sugar plantations in the world being established by the Tabasco Plantation Company at Oaxaquena, Mexico. This engine is of the simple heavy duty type, 30-inch bore and 50-inch stroke, and will weigh 165,000 pounds. The new plant for which this engine is being built will cost about $1,500,000. The Fulton Iron Works of St. Louis has the contract for the sugar mill. Some special patented machinery will be purchased at Berlin, Germany. The ultimate grinding capacity of the plant will be 3000 tons of cane a day.

A. F. McIntyre, Western manager at Chicago for Abendroth & Root Mfg. Company, Newburgh, N. Y., reports business as unusually good for midsummer. Among contracts recently closed are 1000 horse-power Root boilers for the new Santa Fé shops at Argentine, Kan., and two boiler installations for Mexican mining companies. Recent sales of Root special riveted pipe include 20 miles of 18-inch pipe for the city of Jacksonville, Ill., and 26 miles of 13-inch for Mexico.

Geo. Cadogan Morgan, engineer, Royal Insurance Building, Chicago, has prepared plans for a water works and electric lighting plant for Williston, N. D., and the building of the plant will begin as soon as bonds can be sold.

The S. M. Jones Company, Toledo, Ohio, has been awarded by the Toledo Board of Public Service a contract for the pumping machinery for the new water purification plant. The price is $54,000. The plant is of 15,000,000 gallons capacity. The pumps are of the centrifugal type, direct driven by 300 horse-power gas engines. The gas engines will be of the Rathbun three-vertical type, built by the Jones Company and operated on producer gas. The producers and pumps will be furnished by R. D. Wood & Co. of Philadelphia, Pa.

The Board of Public Works, Grand Rapids, Mich., will receive bids until August 11 on an elevated tank, 50 feet internal diameter. The proposal calls for bids on both steel and concrete-steel construction and on a tank 52 or 80 feet deep.

Bids will be received until August 8 at Greenwood, Wis., for a new electric light plant. Work consists of a concrete or wooden dam, turbine shafting, frame power house, 50 to 60 kw. belted dynamo, pole line end wiring. Oscar Claussen, St. Paul, Minn., is engineer.

The Stebbins Mfg. Company, Sturgis, Mich., will purchase a 100 horse-power steam plant and dry kilns.

The Independent Pneumatic Tool Company, First National Bank Building, Chicago, which recently bought the plant of the Aurora Pneumatic Machine Company, including the patents on the Thor pneumatic hammers, drills and turbine saws, reports a heavy booking of business from railroads and other metal working industries in this country, as well as an unexpectedly large foreign business.

According to a report made by Receiver John I. Beggs, the National Electric Company of Milwaukee was run at a profit of $46,795 from May 16 until July 15. In his capacity as receiver Mr. Beggs has materially reduced the running expenses, at the same time continuing the work of getting out old contracts and taking in new ones.

The Giddings-Lewis Mfg. Company of Fond du Lac, Wis., has recently secured a contract from the Japanese Government for the building of a saw mill in Manchuria. The contract calls for ten carloads of saw mill machinery and was closed with the Fond du Lac company by Haruki Yamawaki of Tokio, a director of the Japanese Imperial Company.

The Duplexophone Company, Lincoln, Neb., expects shortly to be in the market for one small gear cutting machine, one small sensitive drill press and one small automatic turret lathe or spindle maker. This company, which is incorporated for $300,000, has almost completely equipped a new factory for the manufacture of both cylinder and disk duplexophones and supplies, including a very completely equipped aluminum foundry.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 1, 1905.

Notwithstanding the usual midsummer dullness the tone of the local machinery market is good. July as a rule is a quiet month and the past one has been no exception. There was a fair run of business during the early portion of the month, but this fell off to some extent as the month advanced and the closing week has been particularly inactive. Vacation periods are no doubt the cause of a large share of the present dullness of the market, and until business again settles into its regular course the closing of a number of propositions which have been before the trade will no doubt be held up.

Manufacturers of machine tools, special machinery, &c., have in most cases sufficient orders on their books to keep them actively engaged during the next few months; in some instances the capacities of plants are fully taken for periods extending over the remainder of the year, this being particularly noticeable on the part of the locomotive builders. On the other hand there are many manufacturers who are receiving only sufficient orders from day to day to keep their plants operating fully. In the latter cases opportunity is being taken for the purpose of making stock, principally of standard tools, for which there will no doubt be a ready market as soon as the fall season opens. While inquiries have fallen off to a considerable extent during the past few weeks, there is a strong disposition on the part of probable buyers to feel the market at this time. Such tools as are really needed are closed for quickly, and frequently the ability to make prompt delivery has much to do with the placing of the order.

The amount of unclosed business before the trade is encouraging for the future and that a good number of tools will be wanted is unquestionable, but just when the orders will be placed is hard to say. It is the belief of the majority of the trade that a strong buying movement will start in early in September, others claim that date is too early, October 1 being a more likely time, and again there are some who believe that a marked improvement will be shown during the present month. With all there is a general feeling of satisfaction throughout the trade as to future conditions and a confident belief that the business of the last half of the year will be fully up to expectations.

There has been some slight improvement in the foreign demand. Orders have been taken for a number of tools for export, but the conditions are not particularly favorable for an extensive development of this branch of the trade at the present time.

The Pennsylvania Railroad has awarded contracts for the enlargement of its Harrisburg shops to J. N. Bastress & Co. and Aherns & Bro. Work will be started at once and pushed forward rapidly. It is said that the management intends making repairs at the above point for both Pennsylvania and Northern Central locomotives and rolling stock, to avoid sending the work to either Altoona or West Philadelphia.

The Main Belting Company, Thirteenth and Carpenter streets, will erect a three-story addition, 45 feet by 105 feet, adjoining its present plant. The new building will be used for factory and storage purposes as well as for the offices of the company, and will enable it to increase its production by over 50 per cent. The building is specially designed for the carrying of heavy loads and is of the slow burning construction type. The machinery which will be required in the new addition has not yet been fully decided upon.

The Earle Gear & Machine Works is quite busy. Inquiries for gear work of various classes are numerous and a good number of orders are being received, some of the more recent including a cast steel gear wheel 48 inches in diameter and 24 inches face, a 90-inch cast iron gear, 9-inch face, and a set of three helical gears, 40-inch diameter and 16-inch face, for blower driving.

I. H. Johnson, Jr., & Co., Incorporated, keep busy in all departments. While the immediate demand for lathes is quieter, they have a large amount of work on order and from the nature of inquiries being received anticipate considerable buying for this class of tools in the early fall. Deliveries of lathes continue regularly to all parts of the country, mostly of the medium size tools; some very heavy ones, however, are in the course of building and will be ready for early delivery.

Frank Toomey, machinery merchant, notes a particular inquiry for heavy engines, from which some nice business has resulted. Some good sales of Manning boilers have also been made, including two of 150 horse-power each for the Delaware Hard Fibre Company, Wilmington, Del., and one of the same capacity for the Tabor Mfg. Company of this city; an equipment of eight Cleveland-Hardwith balanced valve engines has also been sold at Coatesville, Pa., rolling mill, making 24 engines of this type that have been sold that party.

The Royersford Foundry & Machine Company, Royersford, Pa., is generally busy. There is a continued good demand for its new line of shaft hangers and mill supplies. In the foundry the company is particularly busy on a general class of work. A number of orders for punch and shear machinery have also been received, recent deliveries of which include two No. 3 combined punch and shears and two No. 3 A single end punches for the South Baltimore Car Wheel & Foundry Company, Baltimore, Md., and a No. 3 A combined punch and shear for export to Cardenas, Spain.

The Tabor Mfg. Company, manufacturer of molding machines, has had a good month's business, a gain of 25 per cent. being made in comparison with sales for the month of July, 1904. The demand for molding machines continues heavy from all sections of the country. Inquiries from the stove trade have resulted in largely increased business from this field. Foreign demand has also improved and orders for a number of 13 x 20 and 14 x 16 inch power ramming split pattern machines have been received for export. Orders for six 7-inch power ramming vibrator frame machines, with complete outfit, and one 11 x 48 inch power ramming split pattern machine have been received from one concern in the West, and a number of the same type of machine of various sizes have been ordered by parties in the Chicago district. Three 32-inch power squeezers, two 18-inch square plain Draper machines and four 14 x 16 inch power ramming split pattern machines have been ordered by parties in the Eastern states. The demand for Taylor-Newbold saws also continues good, orders recently having been received for a number of 22, 36 and 40 inch blades, as well as for grinders and for cutters and holders. The Tabor Company recently delivered a large jar ramming machine with a power yoke device having a draft of 24 inches, for deep railroad castings, while general deliveries of machines on order are going forward regularly.

The Newton Machine Tool Works is receiving orders for a good number of tools, and finds conditions for the midsummer period quite satisfactory. Inquiries are plentiful, and among recent orders taken was one for a large key seat milling machine for locomotive axles; two No. 1 vertical and horizontal key seat millers, one for export to Italy, the other for England; two No. 2 cold saw cutting off machines for the Pacific Coast, No. 2 steel foundry saw for export to Japan, 60-inch portable slotter for electrical work, vertical No. 3 miller for railway shop work and a double vertical chord boring machine for a Pittsburgh bridge company. Shipments have also been made of a No. 2 bar saw for the Denver Mint, Denver, Col.; No. 1 machine for H. Thompson, Waterbury, Conn.; special bar saw for rail work for the Alabama Frog & Switch Company, and a No. 2 cold saw for the Packard Motor Company, Detroit, Mich.

The J. G. Brill Company is very busy and notes a particular demand for its Eureka maximum traction trucks. Among recent foreign orders for these trucks may be mentioned: 180 for the Tokio Electric Railway Company, 40 for the Tokio-Densha Tramways, 42 for Marseilles, France; 40 for Wigan, England, and 34 for Cape Town, South Africa. These trucks were also used under 28 semiconvertible cars recently shipped to Lisbon, Portugal, and under 15 shipped to Manila, Philippine Islands. There is also a large domestic demand for the trucks and the Brill Company keeps continuously busy in all departments.

Government Purchases.

WASHINGTON, D. C., July 25, 1905.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 8 for a quantity of supplies for the Boston, Newport, New York, League Island and Norfolk navy yards, including schedule 39, ventilating sets; schedule 41, hydraulic jacks, Pratt & Whitney turret lathes, portable drills; schedule 42, motors, lathe, sanding machine, &c.

The Isthmian Canal Commission will receive bids until August 22 for steam hammers, radial drills, grinding, boring and pipe cutting machines and pulling and track jacks.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 29 for the following machines for the Mare Island Navy Yard: Schedule 49, forges, separator, drop hammer, trimming press, tube cutting off saw and railway cutting off saw.

Specifications are being prepared by Superintendent Elliott Woods of the United States Capitol, Washington, for the erection of a central power plant. Congress has appropriated $1,500,000 for the construction of the plant, including the equipment, &c.

The Isthmian Canal Commission will receive bids until August 25 for machinery and the necessary appliances for the establishment of a laundry on the Isthmus of Panama.

The Isthmian Canal Commission will soon purchase a 25 horse-power gasoline engine.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 15 for forges, saw filing machine, blowers, &c., for the Eastern navy yards.

The following bids were opened July 18 for supplies for the various navy yards:

Bidder 18. Belknap Hardware & Supply Company, Louisville, Ky.
30. California Electrical Works, San Francisco, Cal.
38. Dunham, Carrigan & Hayden Company, San Francisco, Cal.
46. W. D. Forbes Company, Hoboken, N. J.
53. Arthur Gamwell, Seattle, Wash.
55. Richard H. Grey, San Francisco, Cal.
56. General Electric Company, Schenectady, N. Y.
61. Handlan-Buck Mfg. Company, St. Louis, Mo.
76. Hallidie Machinery Company, Seattle, Wash.
82. Wm. G. Johnson, Seattle, Wash.
85. J. B. Kendall, Washington, D. C.
99. Manning, Maxwell & Moore, New York.
111. Northern Electric Mfg. Company, Madison, Wis.
124. Pacific Hardware & Steel Company, San Francisco, Cal.
131. Pacific Tool & Supply Company, San Francisco, Cal.
132. H. A. Rogers Company, New York.
146. B. F. Sturtevant Company, Hyde Park, Mass.
148. William Sellers & Co., Incorporated, Philadelphia, Pa.
152. Sprague Electric Company, New York.
153. Sherman, Brown, Clements Company, New York.
161. Schwabacker Hardware Company, Seattle, Wash.
167. Thresher Electric Company, Dayton, Ohio.
170. Tatum & Bowen, San Francisco, Cal.
182. M. G. West & Co., San Francisco, Cal.
194. Burke Electric Company, Erie, Pa.
196. F. S. Banks & Co., New York.
198. Crocker-Wheeler Company, Ampere, N. J.
200. William Wirt Clarke & Son, Baltimore, Md.
203. Caldwell Bros. Company, Seattle, Wash.

Schedule No. 10.

Class 14. Four hydraulic jacks—Bidder 38, $353.56; 53, $400; 55, $430; 61, $338; 76, $405.60; 82, $370.20; 85, $302; 99, $306.50; 124, $345.40; 131, $292; 132, $244.70; 153, $342; 161, $403.20; 170, $327; 182, $460; 196, $321; 200, $300.80; 203, $375.

Class 22. Two 4 horse-power semi-inclosed motors—Bidder 30, $270; 56, $328; 111, $320; 152, $330; 194, $299; 198, $312.

Schedule No. 21.

Class 131. Two forced draft blowers with engines attached and spare parts—Bidder 46, $2035.50; 146, $1317.04.

Schedule No. 23.

Class 182. One Sellers No. 1 universal tool grinder and shaping machine—Bidder 148, $1240.

Class 183. One exhaust system complete—Bidder 151, $1325 and $821.

Schedule No. 25.

Class 191. Ten 3 horse-power D. C. 125-volt motors—Bidder 56, $3670 and $3850; 167, $4000.

Class 192. One electric motor and all necessary parts for converting from belt to electric drive—No bids.

The Isthmian Canal Commission opened the following bids July 19, under serial No. 240:

Class 1—Item 1, centrifugal sand pump and engine, 16-inch; item 2, centrifugal pump, 3-inch, and engine; item 3, pulsometer; item 4, boiler feed pump; item 5, air pump; item 6, centrifugal circulating pump and engine; item 7, surface condenser; class 2—item 8, two duplex steam pumps; item 9, three internally fired boilers; class 3—item 10, two double cylinder, double friction drum hoisting engines.

M. T. Davidson, Brooklyn, N. Y., item 5, $420; item 7, $890; class 2, complete, $10,200.

New Jersey Foundry & Machine Company, New York, class 3, complete, $1730.

John H. McGowan Company, Cincinnati, Ohio, class 2, complete, $6792.

C. H. Wheeler Condenser & Pump Company, New York, class 1, item 4, $96; item 5, $430; item 5, $325; item 7, $614.

A. D. Granger Company, New York, class 2, complete, with vertical boiler, $3588, with Scotch boiler, $5820; class 3, complete, $1796.

Fox Brothers & Co., New York, class 3, complete, $1850.

Williamson Brothers Company, Philadelphia, Pa., class 1, item 7, $650; class 3, complete, $2355.

Motley-Green & Co., New York, class 2, complete, $4228; class 3, complete, $3030.

Whitney Supply Company, New Orleans, La., class 3, complete, $2133.50.

Henry H. Meyer, Baltimore, Md., class 3, complete, $2226.50.

Bucyrus Company, South Milwaukee, Wis., class 1, item 1, $5200.

Rumsey & Co., Limited, Seneca Falls, N. Y., class 1, item 2, $223.55 and $202.38; item 6, $219.

Buffalo Forge Company, Buffalo, N. Y., class 1, item 2, $230; item 4, $92; item 6, $365.

Stroudsburg Engine Works, Stroudsburg, Pa., class 3, complete, $1940.

Harry Channon, Chicago, Ill., class 3, complete, $2230.

Advance Pump & Compressor Company, Battle Creek, Mich., class 2, complete, $2262.

H. A. Rogers Company, New York, class 3, complete, $2419.62.

Henry R. Worthington, New York, class 1, item 1, $6309; item 2, $333; item 4, $91.70; item 5, $310.90; item 6, $436.87; item 7, $613.70; class 2, complete, A, $4487.45; B, $4505.98; C, $4982.45; D, $4872.49.

I. P. Morris Company, Philadelphia, Pa., class 1, item 1, $9800.

Joseph Edwards & Co., New York, class 1, item 1, $8488.

Platt Iron Works, Dayton, Ohio, class 1, item 4, $103.23; item 7, $701; class 2, complete, $5342 and $5271.

American Hoist & Derrick Company, St. Paul, Minn., class 3, complete, $1950.

Krogh Mfg. Company, San Francisco, Cal., class 1, item 1, $7761; item 2, $327.50; item 6, $381.50.

Camden Iron Works, Camden, N. J., class 1, item 1, $4920; item 2, $260; item 6, $395.

Vermilye & Power, New York, class 2, complete, $2243.

Morris Machine Works, New York City, class 1, item 1, $4620; item 2, $326; item 6, $274.

Royce & Ricketts, Washington, D. C., class 1, item 4, $110; item 5, $500; item 6, $360; item 7, $690.

The following bids were opened July 25 for a two-motor 3-ton electric traveling hoist for the Norfolk Navy Yard:

Bidder 3, Alliance Machine Company, Alliance, Ohio, $1075; 71, Niles-Bement-Pond Company, New York, $782; 73, Pawling & Harnischfeger, Milwaukee, Wis., $985; 97, George C. Thomas, New York, $1014; 104, R. M. Wilkinson Company, Norfolk, Va., $988.

The following additional awards have been made for machinery for the various navy yards, bids for which were opened June 20:

Hallidie Machinery Company, Seattle, Wash., class 47, one belt driven turret lathe, $1659.50; class 50, one vertical drill press, $128.50; class 51, one pipe threading machine, $465; class 61, one motor driven beveling machine, $3094; class 64, valve reseating outfit, milling machine vise, blacksmith heating forge, &c., $530.16.

Caldwell Bros. Company, Seattle, Wash., class 48, one nut facing machine, $370; class 52, two double dry, motor driven, emery grinders, $699

Niles-Bement-Pond Company, New York, class 49, one belt driven slotting machine, $648.

H. B. Smith Machine Company, Smithville, N. J., class 54, one motor driven band sawing machine, $380.

Garvin Machine Company, New York, class 126, one belt driven engine lathe, $335.

Williams, White & Co., Moline, Ill., class 60, one single cylinder hydraulic keel plate bender, $6150.

Cleveland Punch & Shear Works, Cleveland, Ohio, class 62, one heavy double punch and shears, with motor, $4865.

William Sellers & Co., Philadelphia, Pa., class 63, one motor driven plate planing machine, $4200.

Tatum & Bowen, San Francisco, Cal., class 46, one shaper, $592; class 55, two automatic self feeding circular rip saw tables, with motor, $1164.

Class 53, one automatic knife grinder; class 56, one two-spindle upright molding machine; class 58, one dimension planer, and class 59, one four-roll single surfacer, will be readvertised.

The Isthmian Canal Commission has awarded to the Municipal Engineering & Contracting Company, Chicago, Ill., the contract for two concrete mixers at its bid of $1355 for each machine.

Under bids opened June 27 for machine tools for the various navy yards the following additional awards have been made:

Harrisburg Foundry & Machine Works, Harrisburg, Pa., class 143, three 50-kw. generating sets, $5916; class 165, two horizontal steam engines, $6200.

Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 161, two compound wound direct current engine type generators, $3920.

A French inventor has patented a compass which automatically registers, minute by minute. The compass card is fixed on a steel pivot which rests on a fixed agate, instead of having at its center an agate resting on a fixed steel point. The fixed agate is immersed in a drop of mercury, which serves as a conductor for the electric current which causes the movements of registering.

A huge anchor of a date probably that of the Spanish Armada was recently hauled up from the North Sea, where it had seriously annoyed fishermen by damaging their trawling gear. It was 14 feet long, with flukes 3 feet square. The shank was 13 feet long, and a huge wooden stock which had originally been a part of it had entirely disappeared. The weight was 2 tons, and it was completely covered with barnacles and live oysters.

New York.

NEW YORK, August 2, 1905.

Pig Iron.—The market has quieted down. There have been a few good sales of Basic Pig and of Forge Iron. Prices remain: Northern Irons, at tidewater, $16.25 to $16.75 for No. 1 Foundry, $15.50 to $16 for No. 2 Foundry and $15 to $15.25 for No. 2 Plain. Southern Iron is selling on the basis of $15.25 to $15.75 for No. 2 Foundry, New York harbor.

Cast Iron Pipe.—No large contracts have been placed recently, but while orders are light they aggregate a larger volume of business than usual in midsummer. The Eastern foundries are now very well occupied and prices are firm, especially on small lots. Carload lots are quoted at $27 per net ton for 6-inch at tidewater.

Finished Iron and Steel.—The American Bridge Company reports new orders entered in the month of July slightly in excess of 65,000 tons. While these figures are slightly under those of May or June, they are very close to them. The company has had a very good run of business for the past four months and now expects a period of more or less quiet, to be followed by decided activity from September on. Every indication is presented of a heavy fall trade. A very great deal of building work is coming up and contracting for next year is expected to be lively. Deliveries of Structural Shapes by the mills are not improving, but conditions grow worse, and those who have stocks of Shapes for sale are reaping a good harvest from needy consumers. Other branches of the Finished Iron and Steel trades are in excellent condition, with good promise of increasing business. Quotations at tidewater for shipment from mills are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.64½c. to 1.74½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—A very great change has taken place in the temper of the trade. Inquiries are being received all along the line, and prices are from 50c. to $1.50 per ton higher than they were July 15. Holders are not inclined to sell at anything like quoted prices. A few small lots of Stove Plate, some Pipe and some Heavy Cast have changed hands, but dealers would rather buy than sell in view of the improvement in the attitude of consumers. Inquiries are being received for Steel Scrap, but very little has been disposed of except such as had to be moved. Two inquiries are noted for large blocks of No. 1 Wrought Scrap. A sale was made of 3000 tons of Relaying Rails. Quotations for New York and vicinity are approximately as follows in gross tons:

Old Iron Rails	$16.50 to $17.50
Old Steel Rails, rerolling lengths	14.50 to 15.50
Old Steel Rails, short pieces	13.75 to 14.75
Relaying Rails	19.50 to 20.50
Old Car Wheels	15.50 to 16.50
Old Iron Car Axles	19.00 to 20.00
Old Steel Car Axles	17.00 to 18.00
Heavy Melting Steel Scrap	13.75 to 14.75
No. 1 Railroad Wrought	16.00 to 17.00
No. 1 Yard Wrought	14.00 to 15.00
Iron Track Scrap	13.50 to 14.50
Wrought Pipe	11.50 to 12.50
Ordinary Light Iron	8.50 to 9.50
Cast Borings	7.50 to 8.50
Wrought Turnings	10.50 to 11.50
No. 1 Machinery Cast	13.75 to 14.75
Stove Plate	10.50 to 11.50

Off Cape Hatteras, on the coast of North Carolina, a shoal runs 22 miles out to sea. It is found that neither the light on Cape Hatteras nor the lightship can give a sufficient warning of the dangerous locality. To meet the occasion, it is proposed to build a lighthouse at the outer end of the shallow and to construct it entirely of steel. It is to contain accommodations for two families of lighthouse keepers, rooms for the storage of food and provisions, the usual lighting appliances and machinery, and a powerful steam driven siren. It will be fitted with wireless telegraphy, and connected to the shore by telephone. The cost of construction is estimated at about $750,000.

Recent tests on the corrosion of boiler tubes were made by forcing air through tubes wet by distilled water. In sixteen weeks the loss in weight was 0.315 gram per square inch. When the water was made alkaline the loss in the same time was reduced to only 0.0997 gram, or less than one-third of the former loss. This points to the conclusion that if water in a boiler be made slightly alkaline the corrosion of the tubes may be mimimized.

Metal Market.

NEW YORK, August 2, 1905.

Pig Tin.—The market has maintained a high level of prices during the week and business has been fair. Consumers seem willing to take the usual quantity when any concession of price is offered. This was aptly illustrated on Monday, when Tin early in the day sold at 30.70c. and was quickly snapped up, prices advancing in the afternoon to 30.75c. and closing with sales at 30.80c. The market closed dull to-day, with sales at 33.10c. In London the market was the highest since 1900 and the closing quotation on that exchange was £151 10s., which is a reduction of 5s. since the first cable. The following figures, compiled by C. Mayer, secretary of the New York Metal Exchange, show the strength of the metal from the statistical standpoint. The total statistics for Europe and the United States show the

	Tons.
Total visible supply July 31, 1905	12,270
Against visible supply June 30, 1905	11,938
Against visible supply July 31, 1904	13,818
Against visible supply December 31, 1904	14,768

Deliveries into consumption during July were large, amounting to 3200 tons. The total for the seven months of this year shows an increase of 1900 tons, compared with the same period of last year. The arrivals so far this month consist of 520 tons. There are afloat for American ports, scheduled to arrive this month, 2510 tons.

Copper.—The market has advanced during the week on heavy buying by domestic consumers. This buying has resulted in a scarcity of spot stocks, and there is little metal obtainable from first hands for delivery during August and September. Such spot stocks as are on sale command 15.62½c. for both Lake and Electrolytic. October deliveries are sold on a basis of 15.45c. to 15.50c., but at this figure there is little metal for sale. The last two months in the year can be obtained at 15.37½c. The market intrinsically is very strong, and the statistical position is excellent. In London there has been considerably more activity in Copper, as business throughout England is exceedingly brisk, and wire drawers are making a good profit at the present time. The closing quotation for spot to-day is £68 6s. 3d., while futures are for sale at £68 10s., a decline of 10 shillings since yesterday. Best Selected brands have also advanced, and to-day are quoted at £73 10s. The following statistics compiled by C. Mayer, secretary of the New York Metal Exchange, show the exports for July and the first seven months of this year:

Exports in July have fallen off, yet the total for the seven months of this year shows an increase of 13,480 tons, compared with the same period of last year.

The exports of domestic copper from Atlantic ports for month of July as per custom house returns, were as follows:

	Tons.
From New York	10,328
From Baltimore	6 885
Total	17,213
Total exports since January 1, 1905, exclusive of Southern and Pacific ports for July	147,014
Against same period in 1904	133,564

Pig Lead.—The Lead market continues firm, with quotations nominally unchanged at 4.60c. to 4.70c. The American Smelting & Refining Company continues to quote 4.60c. for shipment Lead in 50-ton lots. The market in St. Louis has advanced to 4.55c. to 4.57½c., being the closing quotation there. The London quotation remains unchanged at £14 for Soft Spanish Lead.

Spelter.—The market is much stronger on account of the floods in the producing districts, and spot stocks are now held in New York at 5.60c. to 5.70c., with August and September deliveries quoted at 5.55c. to 5.65c. At this price, however, there is very little Spelter for sale for future delivery. In St. Louis an advance has likewise taken place, and the closing quotation to-day is 5.45c. In London the price is unchanged at £24. Private advices from the Joplin district are to the effect that Ore is now selling at a price which warrants higher prices for Spelter.

Antimony.—The quotation for Cookson's is practically nominal and any definite figures regarding this brand are apt to be misleading. Hallett's has advanced to 14c., and other brands are likewise selling higher at from 13c. to 14c.

Quicksilver.—Prices are unchanged and $40.50 per flask is the ruling quotation for flasks of 75 lbs. in 100-flask lots. In London the price is unchanged, both Rothschild and second hands selling at £7 7s. 6d.

Nickel.—Prices are unchanged, but business is of fair proportions, and the stocks on hand are ample to meet the present requirements. Large sized lots are obtainable at 40c. to 45c. per lb.

Tin Plate.—Business is active, and Coke Plates are moving in good volume. Terne Plates are rather dull on account of the unfavorable weather for roofing purposes. In New York the price is unchanged at $3.74 per box of 100-lb. IC Coke Plates, or $3.55, f.o.b. Pittsburgh. The mills are making very prompt shipments, indicating that stocks on hand are large. In Swansea prices are unchanged at 11 shillings 7½ pence.

Case Hardening of Steel.*

BY DAVID FLATHER.

The process of case hardening consists in bringing the steel or iron articles into contact with carbon in closed boxes or pots and raising them to the requisite temperature for a sufficient length of time; afterward the articles are reheated and cooled by quenching in oil or water. The furnace should be so constructed as to be capable of being raised to a full orange heat (1000 degrees C.), and maintained at that heat with great regularity. Neither the fuel nor the direct flame should come in contact with the charge—that is to say that the flames should uniformly impinge on the sides and roof of the muffle, thus heating the contents of the muffle by radiated and not by direct heat. The result is most economical in the matter of fuel. There should be a small peep hole in the door, with a cover plate; a hole 1½ inches in diameter is quite large enough.

Fig. 1 shows a small furnace costing about $175. There is an upper chamber in this furnace, and though this is not necessary for case hardening it may in a small works be found useful to have such a chamber and employ it while case hardening is being done, for the insertion of any articles which require annealing. This will add only very slightly to the amount of fuel used. Generally speaking, coal is the fuel employed; but for large works, where a number of furnaces are kept going, gas fired furnaces should give every satisfaction. Hardening pots are made in both cast and wrought iron. The latter bear reheating so many times that they are cheaper in the end. The pots should not be of too large dimensions, or there is great risk of articles in the middle of a charge not being cased to a sufficient depth. The pots should each have a plate lid fitting closely inside.

Perhaps in no part of the process have there been so many differences of method as in the question of the carbonizing material. The carbonizers in general use at the present day are animal charcoal, bones, and one or two other compositions sold under various names, and consisting of mixtures of carbonaceous matter and certain cyanides or nitrates. For very slight hardening cyanides alone are still found very useful, but no great depth of casing is ever attempted with these.

Theoretically, the perfect carbonizer should be a simple and pure form of carbon. The author has found good charred leather to give the most certain and satisfactory results. Charred leather should be bought only from some firm which is actually in the leather or some allied business, and which uses this trade as an outlet for its scrap leather. Even under such circumstances it is important to keep a strict watch over the deliveries, and especially to keep a good lookout for traces of copper and steel rivets—a sure evidence of old boots or old belting. Buy the leather coke in lumps and have it powdered in your own works, taking care that it is not contaminated in the process, and that by the time it is required for use it is perfectly free from moisture.

As clay must be used for a luting round the pot lid, and is also frequently used for stopping off portions to be left soft, it is important to see that a good clay is used, and that it is free from grease.

As all case hardened articles have to be reheated before quenching it is important that a suitable furnace should be employed for the purpose. It is not advisable that the reheating should be done in the case hardening muffle, unless it is run specially for the purpose and at a lower heat. If possible a small gas muffle should be used for reheating, and indeed for all hardening work. A properly constructed gas muffle can be regulated with great exactness, and this is very important in all hardening.

Details of the Process.

The carbonizer having been thoroughly dried and reduced to a fine powder, a layer of not less than 1½ inches in depth is placed in the hardening pot and well pressed down. Upon this are placed the articles to be hardened. Care must be taken to leave sufficient space all round each piece to prevent its touching the others or the walls of the pot; a space of 1½ inches should be sufficient. Another layer of carbonizer is then put in and well pressed down, taking care not to displace any of the articles already packed, continuing until the pot is nearly full, and then finishing off with another layer of 1½ inches at the top. The object in view must be to make the contents of the pot as compact as possible, consistent with a sufficiency of carbonizer in contact with the articles. The more solidly a pot is packed the more effectual is the exclusion of air. The lid is then put on and the joint all round well luted with clay. By the time the proper number of pots have been filled the furnace must have been raised steadily to the full working heat. According to my experience the proper heat for case hardening is 1000 degrees C., or a full orange "heat color."

At the close of the carbonizing period the pot is withdrawn from the furnace and placed in a dry place, where it is allowed to become quite cold. It is then opened and the articles taken out and brushed over to remove all adhering matter. If the pot has been properly packed and

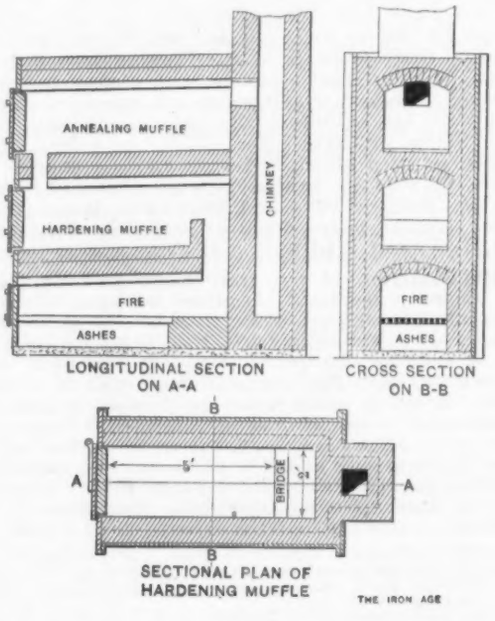


Fig. 1.—Small Annealing Furnace for Case Hardening.

luted up the articles should be quite white, or, at least, have only a slight film or bloom of a deep blue color; the denser and more inclined to redness is the surface the more imperfect has been the packing and sealing of the pot.

The case hardened articles are now placed in a muffle furnace and steadily raised to a good cherry red (800 degrees C.), and then quenched in cold or tepid water or oil, according to the purpose of the articles required. They should remain in the cooling liquid until they are quite cold right through the body of the metal, thus completing the process.

Then we have to determine at what temperature we are to work the cementation part of the process, and to decide this there are several points to be strictly observed. (1) The carbon in the case must be about 0.80 per cent. (2) The case must be neither too thick nor too thin. (3) The temperature must not be so high as to overheat the mild center. (4) The core must be of the greatest possible strength.

Although I have given separate requirements, we must consider them altogether. A temperature of 1000 degrees C., if continued to saturation, would yield a carbon percentage of about 2.5; but if interrupted at any stage short of saturation the skin would contain less carbon, and the center still less, on account of the process of diffusion being still in progress. If we take two pieces of ⅝ inch diameter round mild steel and heat one of them with a carbonizer at a cherry red heat and the other at a bright orange heat for six hours, the first will be

* From a paper read before the Cycle Engineers' Institute, Birmingham, England.

cased to a depth of about 1-32 inch and the other to a depth of nearly 1-16 inch, while the amount of carbon taken up will be about 0.50 and 0.80 per cent., respectively. So that, so far as regards the hardness of the skin, the piece cased at the higher temperature gives the best result. From this we learn that a temperature of 1000 degrees C. will give us sufficient hardness of case.

We have next to find which temperature has the least hurtful effect on the mild steel core. Suppose, for example, we take three pieces, heating at 1000, 1300 and 1500 degrees C., or full orange, white and bright white respectively. We shall find that those at 1300 and 1500 degrees break very short and have lost nearly all their original tenacity, while that at 1000 degrees appears tougher and altogether stronger than before.

Water Hardening.

That part of the process where a most important improvement has been made is the final hardening by quenching in water. In case hardening, as in all other methods of hardening, the steel must be quenched on a rising heat. I may add that for certain purposes there is some advantage to be gained by quenching direct from the pot, if followed by reheating to cherry redness and again quenching. Having made clear the necessity for complete cooling after carbonizing, followed by reheating for water hardening, we may proceed to consider the proper manner of carrying this out. We must remember that the case hardened article now consists of two kinds of steel, one being mild steel of a temper that will not harden in water, and the other capable of becoming glass hard when properly heated and quenched. The critical points of the two steels are not of course the same, that of the hard steel being slightly lower than that of the soft steel. It must be borne in mind that to obtain complete hardness in the skin and the maximum of strength in the core they must both be heated to their critical temperature before quenching. Now, as the critical points of the two are not identical, and as they must be raised at least up to these points, it follows that one of the steels will have to be heated considerably above its proper hardening point or the other not heated sufficiently to reach its greatest tenacity. We have therefore to find which of the two will result in the least risk. If we heat the article to the critical point of the hard steel case we do not reach the critical point of the mild core; and, on the other hand, if we raise to the proper heat for the mild we exceed that of the hard steel.

As our object is to obtain hardness combined with strength, and as the strength lies almost entirely in the core, it follows that we must heat sufficiently to remove the coarse crystallization of the core, thus exceeding the critical point of the case; and in doing so, while we obtain very nearly the maximum hardness, we lose very little of the strength of the case and obtain the maximum strength of the core. I have gone rather fully into this point, and, it may be thought, without necessity, as the temperature is almost universally judged by the eye. But my object in doing so is to point out how important it is for the second heating to be sufficiently high to obtain the best result. The case hardened steel as it comes from the pot cannot be rendered hard and strong without a sufficient second heating. If a test piece or finished article when broken shows a more or less coarsely granular fracture and has the casing irregularly defined it is an almost certain evidence that the second heating has not been sufficiently high; and this perhaps emphasizes the importance of using test pieces wherever possible. This reheating should, so far as possible, be rapidly performed, and once the article becomes uniformly of the right temperature it should be immediately quenched in oil or water.

Tempering.

It is sometimes desired that the hardness of the case be slightly tempered, but I cannot say anything in favor of it. The object of tempering is, generally speaking, not so much to reduce the hardness as to increase the strength; but we must bear in mind that the strength lies in the core of mild steel, and that even if the strength of this can be increased by tempering (which I doubt), you can only use the "temper color" given by the hard case as an indicator, and this can be no guide to the proper tempering heat of the core. Now, supposing that we are able to increase the strength of the mild core by tempering, it is highly probable that the proper tempering heat, instead of being represented by a "straw color," would be at least "dark blue" temper color, if not "visible red" heat color, and this, of course, would take away perhaps 50 per cent. of the hardness of the case.

It may be desirable for special requirements to make extreme hardness the first consideration. In such cases the case hardening heat may be raised to bright yellow (1250 degrees C.) and then, at the end of the period, instead of allowing it to become cold take the pot from the furnace and when the articles have cooled to a full red heat quench in water or oil, afterward reheating to full cherry and again quenching. Though by this method the absolute strength is much reduced a considerable increase of hardness is obtained.

Having discussed the process of case hardening it may be useful to consider briefly the principal faults which occur. It is always of great importance to put a test piece in every pot and to treat this in the same manner exactly as the articles being hardened. It is, of course, most useful to take one of the article themselves and use it as a test piece, and where possible this should be done. The tests to be applied come under the heads of "hardness" and "strength." The hardness, in the absence of any special scientific tests, is proved by the use of the file; for this purpose a smooth saw file should be employed, and this is a test too well known to need any repetition here. I may, however, remark that when using the file, and it appears as if the test piece were not fully hard, before deciding that this is really the fact it is well to examine the file used, when it may be found that what were thought to be filings from the test piece are really the powdered teeth which have been forced away from the file. Sometimes the extreme surface is quite easily touched by the file and the articles are declared to be soft; if, however, the filing is continued a dead hard surface is found beneath. This has been caused by the action of the air on the steel, either by incomplete sealing in the pot, or more probably by want of care in reheating.

Judging Fractures.

We have next to consider the fractures of the test pieces, and I may repeat that the structure of steel, as shown either in the fracture or the polished and etched section, contains a certain record of at least the last heat treatment through which it passed:

(*a*) Perfectly case hardened steel when fractured will shows a case of extremely fine white grain, which is clearly defined and of very regular depth, while the core is finely granular and of a distinctly metallic luster.

(*b*) The case, instead of having a fine, white, dry appearance, is full of minute, brilliant specks and is not so clearly defined. The core is much coarser and more sparkling, and the test piece would break easily, being more or less rotten. Such a fracture shows either that the article was quenched direct from the pot, or that, if heated a second time, it was not raised to a temperature sufficiently high to rearrange the structure caused by the high temperature of case hardening.

(*c*) The outer zones of the case are coarser, as in (*b*), while the remainder, and also the core, are very little coarser than (*a*). This is the result of too high a temperature in reheating. An article having such a structure would, though of full hardness, wear into little pinholes and specks, and in certain articles of small dimensions very easily break.

(*d*) The case appears as in (*b*), but the core is gray and fibrous, or when broken laterally shows very marked laminations. This is caused by too high and too long heating before quenching.

The Northwestern Iron Company, Mayville, Wis., has begun the erection of a second blast furnace, which will be a modern stack of large capacity. Pickands, Brown & Co., Chicago, are largely interested in this company and handle its product.

OBITUARY.

ROCKWELL KING.

Rockwell King, a Chicago capitalist who was president of the Western Cold Storage Company, president of King & Andrews Company, iron founders, and treasurer of the Harrington & King Perforating Company, Chicago, died at his residence in Chicago, July 28, as a result of blood poisoning which set in from a slight wound on the hand inflicted while pruning shrubbery. Mr. King was born in Chicago in 1853, prepared for college at Phillips Exeter Academy, and was graduated from Harvard in 1874. On leaving college he entered the employ of Adams & Westlake Company, the president of which firm, J. McGregor Adams, was his stepfather. Some years later he, together with his brother-in-law, John Andrews, founded the firm of King & Andrews, who at that time had a foundry on Union street, Chicago, but whose manufacturing plant was moved to Chicago Heights some years later. In 1882 Mr. King bought out the interest of Mr. Oglesby in the firm of Harrington & Oglesby, metal perforators, the name being changed to Harrington & King, and the firm was later incorporated under the name of the Harrington & King Perforating Company, with Mr. King as treasurer, though from the first Mr. King's interest in the firm was purely that of an investor and not as an active participant. About ten years ago he became an active factor in the Western Cold Storage Company, a firm that had been in existence some years but which was at that time reorganized. Mr. King leaves a widow, two sons and two daughters.

NOTES.

WM. MELLEN, aged sixty-eight, died at his residence in Milwaukee, Wednesday, July 26. Mr. Mellen was senior member of the firm of William Mellen & Son, brass founders.

E. E. HAINES, proprietor of the Woodstown Machine Works, Woodstown, N. J. died suddenly, July 27, age 64 years. He had designed a number of patented machines and recently had applied himself to the building of an automobile of his own design.

Iron and Industrial Stocks.

NEW YORK, August 2, 1905.

Quite a number of important movements occurred in industrial stocks during the week. American Steel Foundries declined to a very low point on Thursday, when the common sold down to 67/8 and the preferred to 36¾. A day or two afterward announcement was made that the proposed issue of bonds had been underwritten and both classes of stocks advanced sharply, the common selling up to 10¼ and the preferred to 41⅜ to-day. Allis-Chalmers common advanced from 15⅝ on Thursday to 19½ on Tuesday and the preferred from 56¾ to 64, with rumors of favorable developments affecting the future of this company. Another stock to show a decided advance was Pressed Steel common, which moved up from 39⅛ to 43, owing to reports of the placing of large car orders. Car & Foundry common, under the same stimulus, advanced from 35½ to 37¾. Tennessee Coal advanced from 85¾ to 91¼, but receded on Tuesday of this week to 88½. United States Steel common ranged during the week from 34 to 35⅝ and the preferred from 102¼ to 104⅛. Colorado Fuel showed a range from 44¾ to 46¾. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can common 11¾, preferred 68⅝; Car & Foundry common 36⅝, preferred 99¾; Locomotive common 48¾, preferred 112; Steel Foundries common 10¼, preferred 41⅜; Colorado Fuel, 45⅞; Pressed Steel common 42½, preferred 95¾; Railway Spring common 35½, preferred 90; Republic common 20⅝, preferred 83⅝; Sloss-Sheffield common 86½, preferred 105; Tennessee Coal 89¼; United States Steel common 35, preferred 103⅝.

The J. A. Gaylord Company, New York, is offering at 92½ the Lehigh Iron & Steel Company's 15-year 6 per cent. first mortgage bonds, part of a $300,000 issue.

Dividends.—Pressed Steel Car Company has declared the quarterly dividend of 1¾ per cent. on the preferred stock, payable August 29.

The Thomas Iron Company paid its usual semiannual dividend of 4 per cent. on August 1.

We can deny officially press reports to the effect that a consolidation of the interests of the Jones & Laughlin Steel Company, Pittsburgh, and the Lackawanna Steel Company, Buffalo, N. Y., is about to be made. No such project is under way or contemplated.

A Projected Steel Plant in New York Harbor.

Incorrect reports having appeared in the daily press relative to the business of Milliken Brothers of New York, the following statement is official: This firm has now been engaged in the steel and iron business in New York City for nearly fifty years. The structural business which they have developed has grown very rapidly in the last few years and now extends to all quarters of the globe. In order to more conveniently handle this business it has been decided to conduct it under the corporate form and under the name of Milliken Brothers, Incorporated. The new corporation has a capital of $2,500,000 which is held entirely by Edward F. Milliken and Foster Milliken. No new interests are included in the new arrangement and the business in future will be conducted the same as in the past.

As far as the reports are concerned on the building of basic open hearth steel plant and mills to roll the raw material used by them, no plans have been definitely decided on, nor will any definite action be taken in connection with this matter for several months yet. Milliken Brothers, Incorporated, may decide, however, to build mills for rolling structural shapes and plates, as the necessity of doing so has become apparent to them in order to hold and control their export business, and their location on tidewater is advantageously situated for export trade.

George L. Reis, formerly general manager of the Illinois Steel Company and lately general manager of the Lackawanna Steel Company at Buffalo, N. Y., and Alexander K. Hamilton, lately chief engineer of the Lackawanna Steel Company, have entered their employment. No association of outside interests or manufacturers is contemplated in case this proposed steel plant should be built. Milliken Bros. do not contemplate the purchase of any additional property at Staten Island, as they already have a site more than ample for their present bridge and structural steel plant and rolling mill, should they decide to build the latter. This site covers several hundred acres of ground, with over 1-3 mile of water front. It is located on the north shore of Staten Island.

New York Pig Iron Warrant Market.

The buying movement in the Pig Iron Warrant market in the Produce Exchange fell off somewhat during the week ending at noon on Wednesday, the total of the week's recorded sales amounting to 1400 tons, while the prices at sale and established on call were lower. The transactions of the week were as follows: 100 tons August, regular, $15.25; 400 tons September, regular, $15.15; 200 tons November, regular, $15.35; 100 tons September, regular, $15.10; 100 tons October, regular, $15.25; 100 tons October, regular, $15.30; 100 tons October, foundry, $15.30; 100 tons August, foundry, $15.20; 100 tons September, regular, $15.05; 100 tons October, regular, $15.15. The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	$14.85	$15.25	....	....
August	14.90	15.15	$15.00	$15.50
September	14.90	15.15	15.00	15.50
October	15.00	15.20	15.00	15.50
November	15.00	15.35	15.00	15.50
December	15.00	15.50	15.00	15.50
February	15.00	15.50	15.15	....

The Wheeling, W. Va., Board of Trade, R. B. Naylor, secretary, has prepared a folder on "A Few Things that Have Made Wheeling Famous." A synopsis of the prominent industries of Wheeling is given, with facts as to their output and the capital invested. According to the 1900 census Wheeling had 406 manufacturing establishments, with capital of $13,225,000, and 7500 wage earners were engaged, the products being valued at $17,000,000. Eight railroad lines enter the city.

HARDWARE.

IT is not alone the Hardware trade which is perplexed, we might almost say agitated, over questions concerning the distribution of goods, the finding of new channels and the breaking down of old. This indeed seems to be characteristic of the times, in which progress in one direction or another, sometimes desirable and sometimes undesirable, is a necessary condition of business activity. These changes are illustrated in a controversy which is going on at the present time in the grocery trade. It appears that the National Wholesale Grocers' Association, an organization of jobbing houses, recently took action against direct dealings between the manufacturers and retail grocery houses, deciding, in fact, that until such time as the offending parties should desist from selling the retailer direct the members of the association would refrain from giving them any patronage whatever. This locking of horns would indicate that the jobbers propose to make a stand against the growing tendency on the part of the manufacturers to sell the retail trade. Some large distributers of food products express the belief that the jobbers will find it difficult to stem the tide. It is the old story—competition is so keen that the manufacturers, packers and importers feel that they must save the middlemen's profit on a portion of their outfit if they are to make their business pay. At the same time the aggregate number of retail dealers whose accounts would be acceptable to them is not very large, including mainly the leading or so-called fancy grocers in cities and larger towns. Such houses are, however, important and influential customers. The average retail trade scattered throughout the country is too small for manufacturers to handle economically, and they fully recognize their dependence on the jobber for canvassing and for distributing goods in small lots, and especially to houses, of which there is a much larger proportion in the grocery than in the Hardware trade, who are entitled to only limited credit.

It remains to be seen whether the jobbers will be able to maintain their position, and how determined the manufacturers will be in insisting upon their privilege, which is obviously reasonable and to their interest, of selling to retail houses which are large enough to deal with them directly. Insistence on the positions which the two parties most immediately in interest are assuming may involve something of a rupture in what have been in the main harmonious relations. It may be that manufacturers who have become too much tied up to the jobbers as distributers will find it a difficult and costly work to get along without their help. Whether or not they will seriously make the attempt will probably depend on the special circumstances of each case, as a decision is reached by the manufacturer as to what his wisest course will be, all things considered. There is little probability that all will decide upon the same policy, with a likelihood that the best class of retail trade will find themselves in a position to buy from either manufacturer or jobber, as may be for them most advantageous.

Some manufacturers, of course, are so strong as not to feel their dependence upon the jobber. Their goods are in such demand that the jobber has to buy them, and would have to buy them if he did not make a dollar's profit on their sale. In this phase of the case, a striking illustration is given of the value of a manufacturer's name and of a factory brand which is held in high esteem in the market at large. The average manufacturer, however, is not in this enviable position. Many of them are far too dependent on the jobbers and have little reputation for their goods which gives them a standing with the public. It may be that direct relations with the retail distributers might be utilized to attain a prestige which they are not likely to enjoy under the present system.

The sentiment of the retail grocers apparently is strongly against the method of boycott adopted by the jobbers, and opinions are expressed that the promotion of buying exchanges, purchasing agencies, &c., will go on much more rapidly as a result of the action taken. There is little doubt that the outcome will be the recognition of the right of the manufacturers to sell retail merchants, and that the volume of such direct dealings will depend upon the number of retail merchants whose business is large enough to make such direct relations mutually advantageous. In this the grocery trade will be following the experience of the Hardware trade, in which there is so marked a tendency toward closer relations and larger transactions between the manufacturers and the distributing merchants throughout the country.

Condition of Trade.

Comprehensive reports from many representative manufacturers and wholesalers covering the principal manufacturing and distributing sections are almost a unit regarding the present favorable business outlook. An occasional discordant note, telling of moderate trade or unsatisfactory conditions, appears to be mainly attributed to local or special causes. Southern territory has suffered somewhat from heavy rains for a month past and in some sections only an average crop of important staples is expected. Quarantine regulations at New Orleans are a disturbing element which it is hoped will not develop seriously. A predominating phase of this practical testimony, coming as it does from widely scattered and thoroughly competent sources, is the magnitude of the trade for the first half of the year, in one instance being 50 per cent. in excess of any previous corresponding period. Mention is also made of the influx of orders for the ensuing season, accompanied by references to repeat orders thus early, doubtless from overcautious buyers whose specifications fell short. There is also practical unanimity regarding the prospects for a fine fall business, which, although necessarily prophetic and only an expression of opinion, is nevertheless based on information regarding abundant crops of staples of good quality already assured, building operations, an improved situation in raw materials, steadiness of prices and other significant details gathered by practical men of large affairs. There is a decided absence of complaint regarding collections, while mention is made of the great demand for Harvesting Implements and supplies. Exports of manufactured articles exceed in value previous records.

Chicago.

Current demand for summer goods is excellent, except for Garden Hose and such other lines as thrive in dry weather. Fall business is opening up satisfactorily and the inquiry for both Black and Galvanized Sheets is a little better than usual with Hardware trade at this date because the fact is recognized that Sheets are extremely low now and may easily be higher before cool weather. This sentiment has also had a beneficial effect on Hods, Scoops, Pipe and Elbows, Eaves Trough and Conductor Pipe and other lines made from Sheet Steel. The recent sharp advances in Spelter are serving to give added stimulus to the Galvanized Sheet market. Axes are moving well. There has been a disposition on the part of Hardware merchants to delay their purchases of Stoves

later than usual, but this trade is beginning to develop satisfactorily. Builders' Hardware trade is still going on at high pressure and factories are beginning to lag behind in the shipment of the less expensive grades. Hardware for three large downtown buildings was placed during the last week, though details are withheld for the present. Advancing prices on Linseed Oil have stimulated a demand for Paints, and sellers of Mixed Paints are kept extremely busy supplying the wishes of their customers. With the teamsters' strike practically over a good deal of local business that has been held up on this account is now released and deliveries are made quite generally in every part of the city. General feeling in the Hardware trade, both wholesale and retail, is one of satisfaction at the volume of business now being received and at the outlook for a continuation of business activity through the fall and winter.

Cleveland.

THE W. BINGHAM COMPANY.—Considering the time of the year and the fact that all the farmers are busy getting in their hay, wheat and oats, and also that many salesmen are off the road taking their vacation, the month of July is going to round up with a very satisfactory amount of business to the wholesaler as well as the retailer. There has been an unusually large demand for Scythes, Snaths, Scythestones, Cradles, Sickles, Hay Rope, Pulleys and Carriers this year on account of the large crop of hay, wheat and oats. Orders for fall goods are coming in freely from customers, and everything points to a very satisfactory and large trade the coming fall. A good many orders have been booked for Skates, Hand Sleds, Cross Cut Saws, Files, Husking Gloves and Pins, Steel Mink Traps and other goods used in the fall and winter.

Daily orders contain well assorted lots of goods. Large quantities of Carriage and Machine Bolts are ordered. Lock Sets and House Trimmings of all kinds are in good demand. Nails and Wire are going out in good assorted lots. In fact, merchants are buying all goods in a conservative way, keeping stocks well assorted and buying often. The repetition of many articles on orders from some sections would indicate that many customers do not buy enough of some of the different kinds of goods at a time.

All goods in the Hardware line are so cheap now that customers should not be afraid to stock up liberally, for it is a well-known fact that the man who has the goods on his shelves when customers call for them is the man that gets the trade. A man that gets in the habit of being out of an article when it is called for cannot hold a satisfactory trade. Our advice is to buy now (that is "going" goods), as prices are low, even and steady and have been for some time back, and will be, we think, for some time to come. It is to the interest of retailers to buy more liberally (that is, as to quantity) from salesmen and through mail orders. However, we know advice is cheap and people generally do as they please. It is a well-known fact that well assorted stocks on hand, although they may be limited to a few kinds, are better than an attempt at a great variety and not so well stocked.

Early in the season there was a scarcity of Shovels, Spades and Ditching Tools. The manufacturers have now caught up on their orders and jobbers are now well supplied, and retailers can order with the assurance that their orders will be shipped out promptly for the different lines. Ditching Spades were short early in the season, but they will be used again in the fall, and retailers will find the jobbers fairly well supplied.

Large quantities of goods are going forward from this section now by boat to the north and northwest, and we expect to enjoy a very large trade up to the close of lake navigation. Merchant Pipe, Steel and Wrought Iron, is cheap now, and we are well stocked and can make prompt shipment. Also our stocks are complete in Malleable, Cast and Brass Fittings of all kinds for oil, steam and water use. There is also a fair demand for Black and Galvanized Sheets, Roofing and Bright Plates, Sheet Zinc, Steel and Cast Iron Registers and Grain Scoop Shovels. Manufacturers in this section are all busy turning out goods in their different lines for immediate and fall shipment.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Notwithstanding complaints from some portions of the South, July has been a very satisfactory month. Business has increased over last year. While volume of sales is satisfactory we observe with interest more cutting of prices on staple lines of goods in this market than for some time past. It is quite evident that jobbers in their desire to increase their volume are willing to part with a certain amount of their profits.

It is of course a question whether this policy of cutting prices will attain the object desired. It is recognized by those who are posted in the trade that taken upon the average, especially as far as manufacturers' brands are concerned, one large jobber enjoys very little if any advantage over another. The cutting of prices on staple manufacturers' lines naturally immediately leads to retaliations. In these days of numerous salesmen and long-distance telephones the area of cutting rapidly widens, all jobbers in an incredibly short period of time adjust themselves to the new and lower basis, and then the state of affairs is just as it was before, the only difference being that the jobbers are doing business on certain staple lines on a lower level of profits.

A feature of present conditions is the liberal number of new stocks being sold in the West and Southwest.

We extend to our sister city New Orleans our sympathy in the misfortune that has come upon her in the form of yellow fever. It has been so many years since yellow fever has been epidemic in New Orleans we had hoped improved sanitary conditions had caused yellow fever to be a thing of the past. It is especially to be regretted that yellow fever should have broken out in New Orleans just at this time as that city has been enjoying for some time past a substantial boom. We sincerely trust the scourge will soon be stamped out and that the era of prosperity that has set in in the Crescent City will not be checked.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Clearings in all Pacific Coast cities show large increases weekly over same week of preceding year, demonstrating clearly that business is good. We have had an unusually long spell of warm weather for this section but not a known case of heat prostration. While in some cases the hot weather may have reduced crop prospects, on the whole little damage has been done and harvest is now on in full swing.

This week one of the two daily trains between Portland and San Francisco arrived in four sections, while at same time trains from the East and State of Washington were crowded to standing room, showing conclusively the interest in the Lewis and Clark Exposition. Of all our buildings in the Exposition grounds none attracts the attention of the Eastern people like that of the Forestry Building, built of immense logs of Oregon fir—a building unique in itself and unknown in any previous Exposition. As showing source of log supplies to-day the writer was told of a quarter section of timber land comprising 160 acres that logged 14,000,000 feet, an immense cut for any densely wooded country.

Trade and collections holding up well for midsummer leads us to hope for a good fall business.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business has been a little quiet for the past ten days. This is not the season of the year when a rushing business is expected, and the rains which continued for about 30 days throughout almost all of the Southern country have had a tendency to depress business. Weather conditions, however, have been more favorable for the past ten days, and merchants report farmers as feeling in better spirits, but buyers are disposed to await futher developments as to the crops. We need not expect a good business until a fair crop is assured. The wheat crop, which has been threshed in this section, was short in the first place and the quality was damaged by rain while in the shock.

The continued rains at a time when corn and cotton should have been worked have materially injured the growth of these crops. We therefore cannot expect an abundant yield this year, but with favorable weather we hope for an average crop and everything indicates that prices of farm products will be high. Before we make any confident prediction as to the fall trade we would like to be able to see further into the crop outlook. We are having about the usual trade and collections for July.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—There has been no noticeable increase in the volume of trade during the past two weeks, or since the date of our last letter to *The Iron Age*, but at the entering of the month of August we look for quite a revival in business, beginning practically with the early days of the month. Salesmen as a rule have completed their vacations and the home force will complete theirs during the present month. As it is understood that only a small portion of the force can go at one time, the vacation period necessarily extends over the months of June, July and August, there being few absences, however, in the last month.

Everything indicates a good fall trade. The wheat crop is good, the corn crop is good, the tobacco crop in the sections tributary to our city is also good, and reports from the cotton sections are quite favorable. Manufacturers of various lines of goods in this location are all encouraged and report good prospects for fall trade. This, of course, includes those in the line of Hardware and its correlatives. Manufacturers of pig iron report that the output has been greater than in any six months in prior years, and manufacturers in structural iron report the same favorable conditions, so that everything points to a good fall trade. Prices remain without any noticeable change.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Reports coming in from all sides are favorable except for the yellow fever disturbance in the neighborhood of New Orleans and the excessive rains in certain parts of our home State and in the South. This latter has caused the wheat to sprout in the shock, and helps to make the cotton fields rank. Still there is a great industrial movement going on, and the demand for material seems likely to continue. The era of combination is not quite over. We hear of several consolidations. One in our own immediate neighborhood is the refining company for the manufacture of cotton seed oil, soaps, &c., which has bought in several allied institutions and is to have a capitalization of $10,000,000. The home office is located here.

Vacation season is on in full force, and the question of providing competent clerical help during this season is sometimes a serious one, as the temptations for excursions come all in a heap. Fortunately a new crop is issuing from the home inclosure and business schools all the while, and these fledglings have an opportunity to try their wings when the older ones are away.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The favorable conditions that have characterized our reports for some time past on the state of trade in the trans-Missouri region still hold true. The harvest of small grains just completed showed a heavy yield and of excellent quality. The weather continues propitious for ripening corn, and every indication points to a large crop. The fall season is approaching and business men are looking forward with confidence to an active period in all departments. Industrial and commercial activity is well maintained and the general outlook is essentially favorable. The prosperity of the country appears to be on a substantial basis.

The Hardware market is comparatively featureless, and as most lines appear to occupy a fairly firm position it is more than likely that values as a rule will maintain the *statu quo* for the remainder of the year.

Baltimore.

CARLIN & FULTON.—The month just ended has been one of about normal business activity, considering that generally it is one of the dullest in the year. The farming community have been very busy with their crops and the stores in the smaller towns have therefore not been as busy as they will be later, when the harvests are over. Prices of all staples have generally been satisfactory and the outlook for a good price for cotton leads us to expect an excellent trade from the South, which begins generally this month. There is nothing to report as to prices, the market with very few exceptions being well sustained.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Business continues good. There has been some holding back in trade on account of uncertainty about crop condition. This has largely disappeared as harvest approaches. The weather has been very favorable and crops have gained largely. With favorable weather for the next two weeks a satisfactory harvest and fall business are assured.

NOTES ON PRICES.

Wire Nails.—Orders received by the mills are seasonable in volume of business. The market has been steadied by the restricting of output, and as a rule is pretty firm. The exception to this is the advantage some mills have by being able to make low rates of freights to a few points of delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carloads to retailers	1.85

New York.—Conditions remain unchanged in the local market, demand continuing good and prices firm. Quotations are as follows, on the basis of $1.99 for single carloads and $2.05 for small lots from store.

Chicago.—The salesmen's meeting of the American Steel & Wire Company, held in Chicago last week, revealed an unusually strong feeling among salesmen from nearly every point of the compass, to the effect that prices were not always maintained, but that the price cutting was less general than is usual at this between seasons period. Also that the vast tonnage of Nails and other Wire products going into consumption was taken as an earnest of better demand in the near future. Quotations are on the basis of $1.95 in car lots to jobbers, $2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—Demand for Wire Nails is about as large as it usually is at this season of the year. The action of the mills in restricting output is having the effect of steadying the market and prices are fairly firm, concessions being made to a few points of delivery to which some favorably located mills have low rates of freight. The plant of the Pittsburgh Steel Company, at Monessen, which was idle in July for repairs, has started up. The American Steel & Wire Company is operating to about half of its capacity. We quote Wire Nails at $1.80 in carloads to jobbers and $1.85 to single carload buyers, f.o.b. Pittsburgh, plus actual freight to point of delivery.

Cut Nails.—Owing to the absence of several manufacturers from the meeting of the Cut Nail Association held last week no action was taken, and official quotations remain unchanged. The market remains irregular, and prices of Steel Nails range from $1.65 to $1.70, f.o.b. maker's mill, with an occasional shading of the lower price in carload lots. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points West of these cities, 5 to 10 cents advance per keg on Cut Steel Nails.

New York.—The local market remains without any especially interesting features. Owing to the irregularity in mill prices, small lots from store are now quoted on the basis of $1.90 to $1.95.

Chicago.—The advancing prices on scrap and particularly on old Steel Rails are being reflected in a slightly firmer tone in the Cut Nail market. This has not yet reached a point, however, where actual prices are

advanced to the large jobbers, but there is a tendency on the part of sellers to limit options at present prices. Single car lots of Steel Cut Nails to consumers would be quoted at from $1.85 to $1.90, base, with considerably lower terms to jobbers.

Pittsburgh.—The Cut Nail Association at its meeting last week made no change in prices. Demand is only fair and the mills are restricting output to conform to actual demand as nearly as possible. We quote Cut Nails at $1.65, base, f.o.b. maker's mill, but this price is occasionally slightly shaded by one or two mills that are not allied with the association. Iron Cut Nails take an advance of 5 to 10 cents a keg over this price.

Barb Wire.—Western jobbers report that retail merchants are having rather more than the usual demand for the season. Business being received by the mills is moderate, and occasionally shading of prices by a few mills is noted. Official quotations are unchanged, as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago.—Midsummer quiet continues among the mills, but jobbers are greatly encouraged by the sales of the country merchants, which seem to be heavier than is usual in mid harvest. Prices are officially unchanged as follows: Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The market is rather quiet and prices are only fairly strong, being sometimes shaded by a few mills, especially to points of delivery where they have the advantage of low freights. While we do not change our quotations, it should be noted that these are occasionally shaded, as stated above. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Smooth Fence Wire.—The outlook for active trade and a steady market is encouraging, although at present prices are not entirely uniform, as official quotations are sometimes shaded in certain sections of the country. Demand from mills is moderate. Official quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The favorable condition of the corn crop and the success of the hay, oats, winter wheat and other early crops give promise of a heavy fall trade in Fencing. Signs of a strong market are beginning to show themselves, though the actual trading is light. Prices are held fairly firm on the basis of $1.80 for Annealed, car lots to jobbers, and $1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—Only a small amount of new tonnage is being placed, the large season contracts not yet coming out. The market is fairly firm, but prices are sometimes shaded in certain districts. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

Sheet Zinc.—Under date of July 29 an advance was announced in the price of Sheet Zinc, which is now quoted at $7.25 per 100 pounds in 600-pound casks, f.o.b. mill, subject to the following discounts for cash and quantity:

	Cash with order. Per cent.	Quantity. Per cent.	Total. Per cent.
Carload lots	3	5	8
9,000-pound lots	3	3	6
6,000-pound lots	3	2	5
3,000-pound lots	3	1	4
Less than 3,000 pounds	3	0	3

Bolts, Carriage, Machine, Etc.—Within the past two weeks there has been a pronounced improvement in this market. This is apparent not only in the disappearance of the slight tendency to shade prices previously referred to, but in an increased demand. Jobbers are reported to be placing orders freely, expressing confidence in an active trade during the remainder of the summer and throughout the fall. Some individual manufacturers have already advanced their prices to some extent because of the influx of orders and the advance in the price of raw material.

Axles.—There is no agreement as to selling prices among makers of Carriage and Wagon Axles, and the market has been an open one for more than a year. Some two years ago Axle manufacturers got together and established prices, but within a comparatively short time the agreed prices were being cut. This has continued, resulting in a disorganized market and sharp competition among makers, with low prices, goods in some cases having been sold for less than cost. A radical advance in price has been made by the manufacturers of steel which is used in making Axles. At a recent conference attended by a majority of Axle makers, to arrange for the purchase of raw material for the ensuing year, conditions were gone into very carefully, and it was the opinion of those present that considerably more money should be obtained for Axles. While high prices may not prevail from this time forward, the advance in steel is calculated to give firmness to the market and manufacturers are naturally desirous of realizing a fair profit. The following quotations represent in a general way prices to the fair retail trade:

Iron or Steel Axles.

Concord, Loose Collar	4¼ to 4¾c.
Concord, Solid Collar	4¾ to 5¼c.
No. 1 Common, Loose Collar	3¼ to 3¾c.
No. 1½ Common, new styles	3¾ to 4¼c.
No. 2 Solid Collar	4 to 4½c.
Nos. 7, 8, 11 and 12	75 to 75 and 5 %
Nos. 13 to 14	70 and 10 to 75 and 5 %
Nos. 15 to 18	75 and 10 to 75 and 10 and 5 %
Nos. 19 to 22	75 and 10 to 75 and 10 and 5 %

These quotations are sometimes shaded, as are also the net extra prices. Owing to special conditions some makers, however, are able to obtain slight advances on the above quotations. Demand has varied with different Axle manufacturers during 1905, but generally it has been better than in 1904. The present demand is good as a rule, without any indications of speculative buying, which has sometimes in the past been a marked feature of the market when prices of material were advancing. Some makers are well filled up with orders for the balance of the year, and a good trade is generally anticipated for the season of 1905-06.

Window Glass.—A meeting was held last week between the wage committees of hand blown Glass makers and the workers, at which no agreement was reached regarding wages and other matters pertaining to the next fire. All negotiations of the matters under discussion were declared off, and the meeting adjourned *sine die*. Glass is scarce and jobbers generally are advancing prices. New York jobbers have advanced prices, to take effect August 4, as follows: First two brackets, 90 per cent. discount; larger sizes, 88 per cent. discount. It is reported that these prices have been adopted in the western part of the State, also that the jobbers in Toledo, Detroit and Cleveland are quoting the same and that other Western jobbers will adopt similar prices in the near future. Should the manufacturers and workers fail to adjust their differences in the near future it will probably result in further advances in Glass prices.

Rope.—There is a seasonable demand, which is not large but of fair dimensions, while prices continue more or less irregular. General quotations, on the basis of

7-16 inch diameter and larger, are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound, the above figures being shaded ¼ to ½ cent per pound, according to seller and buyer.

Oil.—*Linseed Oil.*—Demand for small lots is good, and inquiries for contract prices are more frequent. Some crushers, it is understood, will not entertain propositions for future deliveries. The market remains firm at former quotations. New York quotations are as follows: City Raw, 53 to 54 cents per gallon, according to quantity; State and Western Raw, 51 cents per gallon, with 2 cents per gallon advance for boiled Oil of either kind.

Spirits Turpentine.—Southern advices report the market firm during the week under review. Since the first of the month an improvement in buying has been noticed in the local market, with prices unchanged. New York quotations, according to quantity, are as follows: Oil barrels, 60½ to 61 cents; machine made barrels, 61 to 61½ cents per gallon.

TRADE ITEMS.

THE GILBERT & BENNETT MFG. COMPANY, Georgetown, Conn., held its annual meeting on July 25, the following directors being elected: Edwin Gilbert, David H. Miller, Samuel J. Miller, Edward F. Jones, Charles J. Miller. At a subsequent meeting officers were elected as follows: President, Edwin Gilbert; vice-president and treasurer, David H. Miller; secretary and superintendent, Samuel J. Miller; assistant secretary, William H. Hunter. Edward F. Jones was appointed New York manager and Charles J. Miller was appointed Western manager. The usual dividend was declared. The capital stock of the company was increased from $750,000 to $1,000,000.

SARGENT & Co., whose Western office is at 40 Dearborn street, Chicago, have recently secured a contract for the Builders' Hardware in the Deering Office Building at Minneapolis, aggregating about $9000. The Sargent Union Lock system will be installed. This is one of the largest buildings ever erected in the Northwest.

THE satisfaction given purchasers of the Myers Sure Grip Sling Unloader for double rail steel track has created a demand for a Sling Carrier that would operate on the single rail steel track manufactured by F. E. Myers & Bro., Ashland, Ohio. To meet this demand P. A. Myers of the company has developed a Carrier of the general type of the Sure Grip Sling Unloader for double rail, but designed to operate on single rail, and on which he has recently been granted a patent.

SINCE the E. J. Gardner Axle & Machine Company succeeded F. Gardner & Sons of Carlisle, Pa., on April 1, 1905, it has made some improvements in the way of new machinery, &c., thus increasing its capacity.

F. E. MYERS & BRO., Ashland, Ohio, are erecting an addition 70 x 200 feet, to be used for foundry purposes, and a new machine shop, 60 x 300 feet, both of brick and stone, one story in hight. To the latter building will be brought a new switch from the Pennsylvania Railroad, also one from the Erie, which will dispense with most of the hauling at present done with teams. As an indication of the business done by this company a shipment of two carloads of Pumps, 900 in number, was taken direct from stock in one day recently. The capacity of the Pump works is upward of 400 finished Pumps per day.

THE 20TH CENTURY MFG. COMPANY, 19 Warren street, New York, reports the receipt of large orders for its 20th Century White Flame Heater, which is a combination gas burner, attaching to any chandelier, wall bracket or portable stand, and supplying light as well as heat at the cost of light only. The heater may also be used for very light cooking, such as the heating of a tea or coffee pot, &c. The company urges the trade to place orders early and not wait until the last moment.

HOLLEY, MASON, MARKS & Co., Spokane, Wash., with whom Mr. Marks has not been connected for several years, have changed their name to Holley-Mason Hardware Company, under which style the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, Plumbers' Supplies, Wagon Materials, Mining and Mill Supplies will hereafter be conducted. The company reports that business for the first half of this year shows a substantial increase, which will doubtless be equaled or exceeded during the second half, as an immense yield of wheat is expected in that section. Arrangements have been completed for a new six-story building covering half a block to be located on the main line of the Northern Pacific Railway, with tracks running the full length of the building. An adjoining warehouse 100 x 150 feet will also be erected.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM W. H. LONG, Cloverdale, Cal., who has bought the Shelf and Heavy Hardware, Stove, Implement, Paint and Sporting Goods business of the Yordi Mercantile Company.

FROM THE MILLIGAN HARDWARE & SUPPLY COMPANY, East Liverpool, Ohio, whose establishment was burned out some months ago, and which will occupy on September 1 its new six-story building now nearing completion. The company has recently increased its capital from $50,000 to $100,000 and is doing a large wholesale and retail business in general Hardware, Stoves, Paints, Sporting Goods, Mill and Potters' Supplies, Electrical Construction and Supplies, Plumbing, Gas and Steam Fitting, Tin and Galvanized Iron work and Iron Construction.

FROM BOWRING & Co., commission merchants, 17 State street, New York, who will be pleased to receive catalogues and discount sheets from manufacturers of goods suitable for export to the Philippines. They request that the matter be sent in duplicate.

WISCONSIN RETAIL HARDWARE ASSOCIATION.

SECRETARY C. A. PECK of the Wisconsin Retail Hardware Association visited Milwaukee last week for the purpose of making preliminary arrangements for the annual convention of the association to be held in that city next February. Mr. Peck is expecting the largest attendance the association has ever had, and with a view to securing more room for exhibits has made arrangements to use the West Side Turner Hall for the meetings and the exhibits. The hall is just a block away from the Republican House, which is the convention headquarters.

THE AMERICA COMPANY, Rockford, Ill., is taking steps to increase its capital stock from $50,000 to $100,000. The company manufactures patented specialties, such as Fishing Reels, small Sewing Machines, Wrenches, Gasoline Flat Irons, Convertible Warehouse Trucks, Typewriters, &c.

A COLD PLUNGE when overheated after an exhausting game of tennis caused the sudden death of H. W. Bailey at Sound Beach, Conn., July 25. Mr. Bailey was actively connected with the Tuttle & Bailey Mfg. Company, 83 Beekman street, New York, manufacturer of Registers, and was an officer and director of the company. His grandfather was one of the originators of the business in 1848, his father having been vice-president of the company until his death in 1899. Mr. Bailey was well and favorably known in the trade and is survived by a widow and two children.

THERE is no truth whatever in the statement which has appeared in the daily press that Henry Disston & Sons, Philadelphia, are looking for a site in Pittsburgh on which to build a plant. Nothing of the sort is contemplated by them.

One-Cent Postage a Parcels Post Scheme.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., August 1, 1905.

THE attention of the Post Office Department has been drawn to the propaganda described in *The Iron Age* of the 27th ult., which, while purporting to be chiefly in the interest of 1-cent postage for the benefit of all patrons of the mails, nevertheless advocates rates on merchandise "low enough to serve the useful purposes of a parcels post."

The promoters of this project are distributing their literature with a lavish hand and are shrewd enough to realize that the best time to make progress with a project of this sort is during the recess of Congress, when members and Senators are at home, and therefore amenable to influences which do not affect them so potently when they are in Washington, and more or less absorbed with the current public business. The various organizations of the Hardware trade, which are practically a unit in opposing all parcels post schemes, should meet this new movement promptly and lose no time in acquainting members of Congress and Senators, and especially those who take their seats for the first time in the coming Congress, with the real object of this new crusade.

Parcels Post Projects in Disfavor.

Inasmuch as promoters of this plan for reducing postage rates are putting forward the proposition for a 1-cent rate on letters, it will interest the trade to know that the Post Office Department is strongly opposed to such legislation, and also that it regards all parcels post projects with disfavor. While the establishment of penny postage is believed to be the next natural step in the way of postage reduction, and therefore something to be accomplished long before a parcels post could be considered, on the score of expense alone, nevertheless the officials take the position that as long as there is a deficiency in the postal revenues concessions in rates ought not to be made and would only result in piling up the deficit which must be met by the taxpayers at large.

Owing to the wholesale extension of the rural free delivery, which now costs the Government $27,000,000 per annum, the postal deficit for the fiscal year just ended exceeded $15,000,000, as compared with $8,000,000 in 1904, $4,500,000 in 1903 and $2,900,000 in 1902. The annual deficit has borne a close relation to the increase in the expense of maintaining and extending the rural service, and as it is authoritatively announced that the service will grow for several years to come at the rate of at least $2,000,000 per annum, it is perfectly obvious that nothing short of higher postage rates will serve to curtail the annual deficit.

Policy of the Department.

It is interesting in this connection to recall the fact that when the letter postage rate was reduced in 1882 from 3 cents per half ounce to 2 cents per ounce a surplus of about $1,500,000 was soon turned into a deficit of $11,000,000, in spite of the very large increase in the use of the mails that followed the adoption of a lower rate. The late Postmaster-General Payne, in reviewing this movement in his last annual report, announced it to be the policy of the Department to extend postal facilities and cheapen the cost of service to the public "whenever the postal receipts exceed or come near the expenditures," but not to make costly experiments in the face of large deficits.

The project to change the postage on merchandise "to a rate high enough to direct the large bulk of merchandise to natural channels of distribution, but low enough to serve the useful purposes of a parcels post," is not very definitely described in these terms, but it is regarded here as probable that the first step in this direction would be to bring forward the Postal Progress League's plan for consolidating third and fourth class mail matter under a rate of 8 cents per pound, just half the present cost of sending merchandise through the mails. It will be remembered that the Hardware organizations throughout the country made a very active campaign against this measure in the last Congress and that it was defeated in the Senate after it had been incorporated in the annual post office appropriation bill in the Senate Committee. Even such a moderate rate of reduction would cost the Government several million dollars in revenues, and while it might not divert "the large bulk of merchandise" from freight and express channels, it would undoubtedly be of tremendous advantage to the catalogue houses and correspondingly injurious to the retail merchants of the country W. L. C.

NATIONAL CYCLE TRADE ASSOCIATION.

AT the closing session of the annual convention of the National Cycle Trade Association, held last week in New York City, the following persons were chosen members of the Executive Committee for the ensuing year:

Chas. H. Turner, Albany Hardware & Iron Company, Albany, N. Y.
Brace Hayden, Dunham, Carrigan & Hayden Company, San Francisco, Cal.
A. J. Holmes, Farwell, Ozmun, Kirk & Co., St. Paul, Minn.
C. L. Kelsey, Kelsey Company, Buffalo, N. Y.
Chas. W. Leng, John S. Leng's Son & Co., New York City.
C. L. Elyea, Alexander-Elyea Company, Atlanta, Ga.
E. J. Lloyd, Bindley Hardware Company, Pittsburgh, Pa.
W. H. Coles, McIntosh Hardware Corporation, Cleveland, Ohio.
Geo. T. Roble, Excelsior Supply Company, Chicago, Ill.
C. J. Schmelzer, J. Schmelzer & Sons Arms Company, Kansas City, Mo.
F. I. Willis, H. T. Hearsey Vehicle Company, Indianapolis, Ind.
James Fintze, Ball-Fintze Company, Newark, Ohio.

The association elected the following officers for the coming year:

PRESIDENT, E. J. Lloyd, Pittsburgh.
FIRST VICE-PRESIDENT, Charles W. Leng, New York.
SECOND VICE-PRESIDENT, Brace Hayden, San Francisco.
THIRD VICE-PRESIDENT, Charles H. Turner, Albany.
FOURTH VICE-PRESIDENT, C. L. Kelsey, Buffalo.
SECRETARY AND TREASURER, A. M. Scheffey, Irving Building, New York.

A committee of five was also appointed from the active membership of jobbers of Cycles and Cycle Materials to canvass the general situation for the purpose of obtaining a larger membership in the association. The committee consists of Charles H. Turner, Albany, N. Y.; C. L. Elyea, Atlanta, Ga.; Charles W. Leng, New York; F. I. Willis, Indianapolis, Ind., and George C. Strauss, Buffalo, N. Y., with President Lloyd as *ex officio* member. It will be observed that the members are scattered geographically the better to represent definite territory, and these members will be expected in a measure to hold themselves responsible, as it were, for the sections represented by each. It is the expectation that this committee will follow up this work and report at a conference to be held with a committee of five manufacturers, named below, in September or October next. The manufacturers' committee comprises W. A. Graham, John H. Graham & Co., New York; Charles A. Persons, Persons Mfg. Company, Worcester, Mass.; William F. Remppis, Reading Standard Cycle Mfg. Company, Reading, Pa.; J. W. Bowman, Fiske Rubber Works, Chicopee Falls, Mass., and H. S. White, Shelby Steel Tube Company, Pittsburgh, Pa.

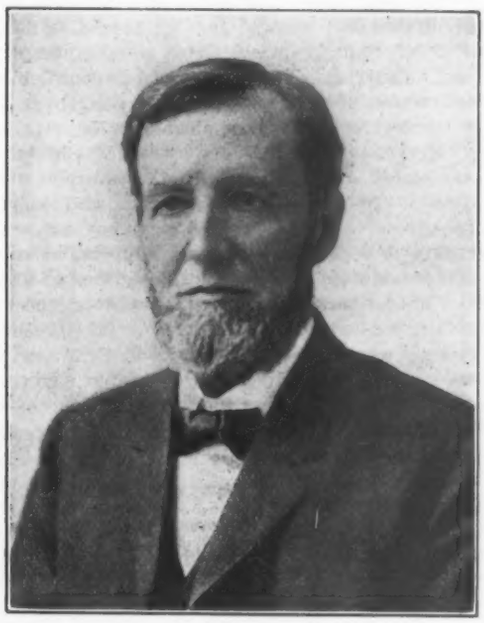
A resolution was also adopted inviting the manufacturers of Automobile Supplies to become associate members of the National Cycle Trade Association and inviting jobbers of Automobile Supplies to become active members. Provision was likewise made for a change in the name of the National Association so that it will represent in tangible form the Automobile business. There seemed to be an undercurrent of feeling which may work out at the next conference that jobbers should have a 20 per cent. margin on Tires and Coaster Brakes.

HAY-BUDDEN MFG. COMPANY, Brooklyn, N. Y., calls attention to the fact that there are now over 100,000 Hay-Budden Anvils in actual service. This will be recognized as an imposing total when it is taken into account that an Anvil lasts a great many smiths a lifetime and that owing to the employment of drop forgings and malleable castings and stampings Anvils are not used to the extent they were in years past, so that the field is a somewhat limited one. The Anvils which make up this tenth of a million are scattered all over the world.

DEATH OF THOMAS COLDWELL.

THOMAS COLDWELL, president of the Coldwell Lawn Mower Company, Newburgh, N. Y., died Friday, July 28, at his home in that city. He had been in failing health for several years. The funeral was held from his late home last Monday, six employees from the shop acting as pallbearers.

Thomas Coldwell was born at Stalybridge, England, September, 1837. His father brought him to America in 1841, and settled at Matteawan, N. Y. When only 11 years old he learned to cut Files in Rothery's File shops where his father was employed. At 15 he learned to grind Files, and at 18 was bound as an apprentice to Mr. Rothery to learn how to forge Files. Mr. Coldwell earned success mainly through his genius for invention. His first real invention was a File cutting machine, which he patented in 1863. He was at that time employed at the Washington Iron Works, Newburgh, where he had a contract under the iron works company to finish gun carriages for the Government. This was



THOMAS COLDWELL.

one of the first machines made for this purpose, and was his first practical accomplishment as a machinist.

In the meantime he had been perfecting his File cutting invention, and had sold an interest in it to Homer Ramsdell and George M. Clapp. In 1864 Messrs. Ramsdell and Clapp sold their interest in the machine to the Eagle File Works at Middletown, N. Y., and Mr. Coldwell removed there to perfect the invention. But File blanks were very imperfectly made at that period, and the File cutting machine was not a great success. Then Mr. Coldwell invented a File stripping machine, which was very successful, and is still in use. He sold it to the Eagle File Works. In later years this invention became a bone of contention among several of the largest File makers of the country, one of whom informed Mr. Coldwell that he would have given $10,000 for the ownership.

In 1865 he abandoned the File cutting machine, left Middletown, and returned to Matteawan, where he entered the employ of H. N. Swift, then the only Lawn Mower manufacturer in the United States. Mr. Coldwell invented several useful tools for Mr. Swift's factory, and also a machine for making felt. Mr. Swift was then making about 150 Mowers a year, selling a hand Mower for $65 and a horse Mower for $310. The idea of making a Lawn Mower was suggested to him by Henry Winthrop Sargent of Fishkill-on-Hudson, who owned an English Mower which Mr. Swift had often repaired. These Mowers were very heavy and the gears were entirely uncovered. The tools which Mr. Swift had for making the Mowers were, if possible, more crude than the machines themselves. Mr. Coldwell made improvements in tools for his employer. Among other things which he invented was the revolving cutter grinder which is now used in many Lawn Mower factories. Mr. Swift gave Mr. Coldwell $25 for this valuable device, and this incident, Mr. Coldwell afterward said, probably had more to do with his branching out in business on his own account than any one other thing. He thought that Mr. Swift had placed a rather small estimate on his ingenuity.

Mr. Coldwell had a fellow workman named Geo. L. Chadborn, a skilled mechanic. Mr. Coldwell and Mr. Chadborn made a Mower which they called the Excelsior. They interested Lewis M. Smith and the late Chas. J. Lawson, Hardware merchants of Newburgh, in the new machine and a copartnership was formed. Messrs. Smith and Lawson provided the capital and Messrs. Coldwell and Chadborn the mechanical skill. The new firm made but one style of machine, a 14-inch, which they sold for $30. The firm name was Chadborn, Coldwell & Co. In 1870, the following year, the Chadborn & Coldwell Mfg. Company was organized with a capital of $4000. Mr. Coldwell was president and held that office for more than twenty years, in fact until he left the company, in 1891. He had a desire to have a business which he could control exclusively. It was his ambition also to introduce some new inventions in Lawn Mowers and some new and improved machinery for manufacturing the machines. He organized the Coldwell Lawn Mower Comany, which began its legal existence October 5, 1891, with the following officers: Thomas Coldwell, president; Albert W. Mapes, treasurer; William H. Coldwell, secretary. The company had a paid up capital of $60,000. A factory was erected which then had a capacity of from 150 to 200 Mowers a day.

Mr. Coldwell advanced the business with all his energy. He divided his time between the factory and the road. He traveled far and wide introducing his Lawn Mowers. He weathered the panic of 1893 and the next year the factory hummed with work. The following year the company had great success and the factory became one of Newburgh's foremost industries. The plant has been enlarged several times and its capacity greatly increased. Hand, horse and motor Mowers were turned out in large numbers.

In 1876 Mr. Coldwell went to Europe to introduce his Mowers there. His trip was very successful and he placed the product with a large firm having houses in London and Paris. When the contract closed four years later he established his own house in London. At the international trial of Lawn Mowers held in Liverpool in 1886 Mr. Coldwell operated his own Mowers and carried off both the first premiums.

Mr. Coldwell in partnership with his son, William H., took out many patents covering inventions on Lawn Mowers, horse and motor, Beef Cutters and various other implements. Mr. Coldwell was a man of varied attainments. He had worked in the capacity of machinist, draftsman, pattern maker and traveler. He was an observant tourist and talked and wrote well on what he had seen and heard. He was also the founder of the Coldwell-Wilcox Company, iron founders and machinists.

Apart from his business, his time was mainly given to religious and benevolent work. He had been an officer of the First Baptist Church for 30 years, and was a mainstay of the Y. M. C. A. for many years. Of the latter he was president for two years. In 1861 Mr. Coldwell married Josephine Terwilliger of Stormville, N. Y., and is survived by two sons and one daughter. Both of Mr. Coldwell's sons were associated with him in business, the eldest, William H., being secretary and general manager of the company.

Mr. Coldwell was once asked what he regarded as the main secret of his successful career. His answer was as follows:

Well, it might be of interest to some young men to say that if I have attained to any greater success than some of my fellow workmen in earlier life I owe it to the fact that I always tried when a workman to do more and better work than my employer expected. I also tried to make myself so useful that he could not do without

me, and also to make myself master of the situation. The more I knew about my work the more I was worth. Then when I had made up my mind that a thing was practicable I never gave it up—no amount of failure discouraged me. If one device failed I tried another, and nothing would induce me to leave a thing after I had once started on it, unless I was convinced that it was actually impossible. To this trait in my character I owe many of my best inventions.

I never believed a wrong or dishonest thing in business would prosper, and never lost faith in myself nor in the overruling power of Divine Providence.

Mr. Coldwell's relations with the men in his employ had always been cordial. He encouraged them in every way and to promote their interest he offered cash prizes for ideas and suggestions presented by the men for the improvement of machinery and tools and the better conduct of the business. Each year the company gives the men a banquet. Mr. Coldwell was also the originator of the idea of offering to students of the manual training school of Newburgh cash prizes, having for their purpose the promotion of mechanical ingenuity.

Mr. Coldwell was public spirited, energetic and always bent on the accomplishment of some worthy object. He had a kindly face, a genial and courteous manner and every cause that promised to be of common benefit found in him a strong advocate.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

DEVERALL PERFECTION MFG. COMPANY, Johnson Place, Brooklyn: Circular price-lists referring to Bench Oilers, Hand Lamps, Engine Tray Sets, Locomotive Oilers and Torches, Faucet and Pump Cans, Plant Sprayers, &c.

WALLACE BARNES COMPANY, Bristol, Conn.: Handsome illustrated catalogue of small Springs for all purposes, small Drop Forgings, Gauges, &c., containing also tables showing difference of Gauges in decimals of an inch, weights of round, square and octagon steel per foot and weights of 1000 feet of flat steel in different sizes.

HARDWARE SUPPLY COMPANY, Grand Rapids, Mich.: Furniture Hardware catalogue No. 5, referring to Door Catches, Spring Latches, Knobs, Desk Lid Supports, Toilet Fasteners and Hinges &c., together with Pamphlet No. 4 illustrating some new goods in the Cabinet Hardware line.

RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn.: Booklet illustrating and describing Russwin Transom Lifters and giving list prices.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Booklet showing mortised electrotypes advertising Stevens Firearms, which will be furnished to the trade gratis.

CHAPIN-STEPHENS COMPANY, Pine Meadow, Conn., and 9-15 Murray street, New York: Catalogue and price-list on Boxwood and Ivory Rules, Plumbs and Levels, Planes, Gauges, Tool Handles, Hand Screws, Box Scrapers, Spoke Shaves, Plane Stops, Door Stops, Turning Saw Frames and Saws, &c.

IRWIN AUGER BIT COMPANY, Wilmington, Ohio: Standard price-lists on Auger Bits and Augers adopted July 1, 1905.

MILLERS FALLS COMPANY, Millers Falls, Mass., and 28 Warren street, New York: Catalogue No. 29, showing the complete line of Tools and Light Machinery which the company manufactures, together with a number of new tools not previously catalogued.

RUSSELL, BURDSALL & WARD BOLT & NUT COMPANY, Port Chester, N. Y.: Complete catalogue for 1905.

COLUMBUS BOLT WORKS, Columbus, Ohio: Catalogue for 1905 of Bolts, Nuts and Carriage Hardware.

CHINESE BOYCOTT OF AMERICAN HARDWARE.

THE step which has been recently taken by the compradores and hongs of the Chinese treaty ports—that is to say, the boycott of American manufacturers—is not without its bearing upon the Hardware trade. The Chinese claim that the Exclusion act was passed without affording them, in reference to a complex subject, sufficient time and opportunity to oppose it, and that as soon as practicable the Chinese merchants of the Pacific Coast issued a pamphlet going to show its violation of treaty rights, its grave injustice and how badly, even for this country, it would be likely to work in future. They alleged that with few exceptions their countrymen had no disposition to emigrate to America; that their religion here was unpopular; that it required them when dead to be buried in China and that therefore but few cared to venture so far away from their own country as to risk the chance of dying and being buried abroad, and that the vocations they filled in America were for the most such as the Americans themselves did not care to fill. In proof of this they showed that of the 28,500 Chinese population of San Francisco 7200 were domestic servants and laundrymen, 3450 employed in powder mills, the manufacture of matches and other dangerous or offensive employments; 600 ragpickers, 4150 merchants, brokers, clerks, porters and employees of Chinese restaurants, places of worship and other purely Chinese occupations; 3700 hucksters, fishermen and suburban vegetable growers; 3150 cigar and cigar box makers and 6250 makers of clothing, shoes and slippers, mostly for Chinese consumption. "In the rural sections of California the Chinese pick nineteen-twentieths of the grape crop" (Congressional Report, p. 1203). "In the mining districts they work those placers which white men have long since abandoned. It is quite safe to say that if they were driven from these industries not one of them would be continued." (Remonstrance of Quang Chang Ling, 2d ed., p. 11).

INDIGNITIES TO CHINESE GENTLEMEN.

In addition to all this they asserted that their official representatives were treated with the greatest indignity; that Cheng Shu Tang, a gentleman of the highest respectability, the owner and manager of vast estates and now one of the Viceroys of China, then Consul General at San Francisco, was spat upon in the streets, his clothing torn and his person rudely treated by a populace whom the police declined to restrain, and that for fear of a repetition of these offenses he could not venture to breathe the air of liberty outside of a closed carriage. This spirited remonstrance, though it was printed both in English and Chinese and passed through several editions, had no practical effect. Kearney's party carried everything before it, and the Exclusion act remained unchanged and unrepealed.

INFLUENCE OF BOYCOTT ON HARDWARE TRADE.

Without discussing its general effects, concerning which much may be said on both sides, it may be instructive to briefly examine its influence on the Hardware trade. For this purpose the official statistics are inadequate. Besides our direct exports to China there are indirect exports. Some of our wares at first exported to Great Britain, France, Germany, Japan, Hongkong and the Philippine Islands are afterward shipped to China. Last year the total imports of China amounted to about $230,000,000, of which about 10 per cent. were sent from the United States, either to the Chinese Empire direct or to Hongkong or elsewhere for transshipment to China. In 1902 our proportion of the total Chinese import trade was 16 per cent., in 1903 it was 13 per cent.: so that although the import trade of China has largely increased our proportion of it has steadily diminished.

DECLINE IN HARDWARE EXPORTS.

Turning from a general survey of this trade to that portion of it which consists of American Hardware the decline is most marked. Of the $23,000,000 worth of commodities which we sent to China last year the Hardware trade represented less than $500,000, and this included

Agricultural Implements, Sewing Machines, Typewriters, Cash Registers, Iron Safes, Tinware, Paints, Glue and several other items which, though usually handled by foreign ironmongers may or may not be strictly regarded as Hardware. The principal Hardware items were Nails, about $140,000; Locks, Hinges and other Builders' Hardware, $60,000; Wire, $25,000; Tools, Saws and Cutlery, $20,000; other iron and steel goods, Stoves, Scales and Balances, Lamps, Pumps and Cycles, each about $20,000; the balance small.

CHINA WAKING UP.

Such a condition of trade with this country, while the internal prosperity of China is showing continued improvement and her general maritime trade a corresponding advance, can hardly be deemed satisfactory. Notwithstanding the efforts of the Viceroys to dissuade the hongs from supporting the boycott against American goods it is quite evident that the latter are pushing the plan as far as they dare. So recently as the 13th ult. they raised $30,000 in Honolulu to assist in the boycott of American goods in China. On the other hand, the Berlin Central Union says: "China is awakening from its sleep of a thousand years. It is building railroads, snapping the old chains that restrained its traffic, abandoning the likin duties and laying steel rails from the coast cities to the interior." The English have built the Canton-Hankau and Peking line, 236 miles, and are building another road from Peking to the south, 242 miles. German capitalists have concessions for a line between Tetschou, Chengting-fu, Yen-tschou-fu and Kai-feng-fu. The German Schantung road is completed. Hardware for all these lines has been and will be naturally shipped from the countries of the railroad capitalists. It is estimated that the Southeastern provinces of China could alone support a railway system of 150,000 miles. Gold, silver, antimony, mercury, lead, zinc and copper ores abound in the Chinese mountains and are being worked as fast as access can be had to them by means of railways. Coal is found in many localities and in great profusion. All this should mean a large demand for our Hardware, instead of which our sales are small and diminishing. Mr. Anderson, our Consul at Hangchau, says: "The sale of American Hardware ought to be greatly increased. The best Stoves sold in China at the present time are from the United States and they are generally recognized as the best. . . . Hardware novelties also have a future. The increasing use of foreign style furniture is causing a demand for Hardware fittings and trimmings. . . It is now common to see a Chinaman with Granite Ware or porcelain lined Wash Basins or similar vessels." (U. S. Consular Reports, February, 1905.) But there is no intimation in Mr. Anderson's report that these articles are obtained from the United States and the statistics of our export trade contain no mention of them.

At the annual meeting of the stockholders of the Kelley-How-Thomson Company, Duluth, Minn., a short time since, the old Board of Directors was re-elected as follows: M. H. Kelley, F. J. Killoran, A. D. Thomson, B. W. How and Geo. W. Welles. The business for the past year showed a handsome increase over that of the preceding 12 months. The stockholders voted to increase the capital from $300,000 to $500,000, which is more in keeping with the large volume of business now transacted by the company. This house commenced business as the Kelley Hardware Company in 1896, with a capital stock of $25,000. In 1901 the company was reorganized, B. W. How being admitted as one of the officers and stockholders, and the capital stock was increased to $150,000. In June, 1902, the company absorbed the Thomson-Glaskin Company, and become known as the Kelley-How-Thomson Company, the capital stock being increased to $300,000. Six months later the company took possession of its present building, where excellent facilities are afforded for the conduct of its large and expanding business.

Wm. Johnston, Eureka, Kan., has sold his retail Hardware and Implement business to Stewart Bros.

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AMERICAN STEEL & WIRE COMPANY'S SALESMEN'S CONVENTION.

THE annual convention of salesmen of the American Steel & Wire Company was held at the Auditorium Hotel, Chicago, Wednesday, Thursday and Friday of last week, followed by a trip through the Joliet mills of the company on Saturday. About 150 salesmen were in attendance and all the sessions of the convention were marked by a spirit of loyalty and enthusiasm which indicates the wisdom of the company in thus bringing together its selling forces for an annual conference. Frank Baackes, general sales agent of the company, presided at the business sessions and addresses were made by D. A. Merriman, G. F. Rummel and other officers of the company. Wednesday morning's session was devoted to the discussion of the manufacturers' trade and the afternoon session to the merchants' trade; Thursday morning to Woven Wire Fence; Thursday afternoon to Sulphate of Iron; Friday morning's session was devoted largely to Wire Rope, electrical products and specialties. This last session was continuous from nine o'clock in the morning until 1.30. The banquet Friday evening was a brilliant affair. D. A. Merriman, assistant general sales agent, acted as toastmaster. Frank Baackes, general sales agent, delivered an address on "Competition"; Charles L. Miller on "Our Manufacturers"; Thomas H. Taylor, New York, on "Criticisms"; N. R. McLeod on "What Constitutes a Good Salesman"; W. H. Jennings on "How to Handle a Customer"; J. S. Keefe on "The United States Steel Corporation." There were also a number of informal addresses. A meeting is to be held later for the discussion of horseshoes. New York was represented by 41 salesmen, who were given a four days' lake trip from Buffalo to Chicago via Mackinac at the expense of the company, including an eight hour stop at Mackinac Island. The menu of the banquet was very artistically gotten up, being printed on deckel edge paper, the left hand pages bearing illustrations of the products of the company and the right hand pages the menu and words of the songs which formed part of the dinner programme.

MILWAUKEE HARDWARE & STOVE DEALERS' ANNUAL PICNIC.

THE annual picnic and grand ball of the Milwaukee Hardware and Stove Dealers' Association of Milwaukee, Wis., was held Saturday afternoon and evening, July 29, at Schlitz Park. The weather man was good to the association though the day opened with indications of rain. All the members of the association closed their stores in the afternoon and proprietors and employees joined in the festivities. In addition to the Milwaukee contingent many traveling salesmen were present and a delegation from the Chicago retail association came up for the occasion, paying thereby a return visit to the Milwaukee association, many of whose members recently attended a similar event in that city. The afternoon was devoted to games and athletic events, for which generous prizes were awarded. The evening was given up to dancing in the large park pavilion. A contest that created great interest among the women was a guessing contest for an Acme Washer, donated by the Pritzlaff Hardware Company. Over 1000 guesses were made as to the exact number of shot contained in a bottle.

BLAIR MFG. COMPANY'S CATALOGUE.

A LARGE and handsome new catalogue is now being distributed by the Blair Mfg. Company, Springfield, Mass. An elaborate frontispiece records the completion of a quarter century devoted exclusively to the manufacture of Lawn Mowers and the following page shows the new model Easy Mower with fac-similes of medals which it has received. There are ten full page cuts illustrating other Lawn Mowers made by the company and a final plate gives sectional and interior views, showing adjustment for ball bearings.

Correspondence.

COLUMBUS, OHIO, July 25, 1905.

To the Editor: The writer has just had called to his attention an intimation by you in your issue of July 20 in the editorial comments on the letter of E. C. Simmons in the private brand controversy that because some of our stockholders and officers were formerly connected with a certain jobbing house we, of course, must be owned and controlled by them.

This may do us irreparable damage with some of our other jobbing friends and customers, and we will thank you to publish in your next issue the fact that we are not owned or controlled by the jobber intimated by you and that none of our officers or directors are officers or directors in this or any other jobbing house. If we are fortunate enough to sell our wares to this prominent jobber it will be because our goods are satisfactory to them, both in quality and price, and for this same reason we hope to be patronized by our other jobbing friends.

THE BALDWIN FORGING & TOOL COMPANY,
By FRANK M. BALDWIN, President and Treasurer.

M. HARTLEY COMPANY CHANGES.

THE M. HARTLEY COMPANY, 313-315 Broadway, New York, continuing its announced policy of withdrawal from the jobbing of goods to domestic trade, thus ceasing competition with its own customers, is rearranging and renovating the store at the above address in harmony with its new plan. The entire store floor is being remodeled and fitted with new showcases, counters, desks and other furniture, so as to make a comprehensive display of the entire product of the three constituent companies, Union Metallic Cartridge Company, Remington Arms Company and Bridgeport Gun Implement Company, owned by the M. Hartley interests and whose entire output the parent house markets.

William J. Bruff, as heretofore, is general manager of the M. Hartley Company, president of the U. M. C. Company and secretary of the Remington Arms Company.

Wilfrid Hartley, treasurer of the Remington Arms Company since 1888 and acting manager of the Remington Armory since 1893, has been transferred to New York and will have immediate charge of the store force. As a token of esteem from the 700 Remington employees, on leaving Ilion, Mr. Hartley was the recipient of a large loving cup of solid silver, a cut glass punch bowl, with gold lined silver ladle and 12 cut glass punch cups.

KELLY'S CUSTOMS TARIFFS OF THE WORLD.

KELLY'S DIRECTORIES, LIMITED, 182-184 High Holborn, London, W. C., England, and 5 Beekman street, New York, has just issued "Kelly's Customs Tariffs of the World." It is a red cloth bound book of 762 pages, each 7 x 10½ inches, and in general appearance is similar to "Kelly's Directory of Merchants, Manufacturers and Shippers of the World," except in thickness. No work can anticipate tariff modifications likely to be made over such a field, but this book is intended to meet a distinct need of the commercial and industrial world in the countries of the globe in enabling a merchant to determine at once what duty, if any, is levied in any country on any exported or imported article. There is an alphabetical index to countries, and at the commencement of each tariff a full alphabetical list of the chief items is given, showing under which number or category any particular article is to be found. There are also tables of foreign moneys, weights and measures, with their English equivalents, at the commencement of each tariff schedule.

Dietz & Haberkost have purchased the Hardware business of Louis Bickel, 511 South Main street, Akron, Ohio.

MISCELLANEOUS NOTES.

Store Door Handles for Cylinder Locks.

Sargent & Co., New Haven, Conn., and 149-153 Leonard street, New York, have brought out three new store door handles for cylinder locks, in attractive patterns. They are known as the Milo, St. Denis and Larna designs and all are cast bronze metal. The first two are made with both flat front and rabbeted lock and the Larna design with flat and beveled locks. The Milo plate is 3⅛ x 17½ inches; St. Denis plate, 3¾ x 19 inches and Larna, 4¼ x 19⅛ inches. All are furnished with two cylinders and packed with screws to match. A turn knob can be substituted for the inside when so ordered. They are all regularly made in Natural, A B and R B finishes.

Standard Carriage Heater.

The Standard Stamping Company, Marysville, Ohio, is offering the Standard carriage heater, oval pattern. This heater has a full metal lining, making a hot air chamber entirely around it and forming a perfectly smooth guide for the fuel drawer, and insulation against burning. The metal ends extend over the edge of the carpet covering to prevent fraying. The heater is equipped with handle for conveniently carrying it. Carbon is used as fuel and is referred to as burning evenly and generating just enough heat without wasting any of it.

Slaymaker Locks.

In his catalogue for 1905, just issued, S. R. Slaymaker, Lancaster, Pa., shows a line of padlocks, French rim locks, railroad locks, night latches, &c., of exceptional completeness. Noticeable features are color plates illustrating some of the regular and special finishes in which locks are offered, and cuts showing a new line of stock assortments furnished with display board in the shape of a padlock, 12½ inches wide and 18 inches high to top of shackle. Special attention is called to the line of wrought iron French and American rim locks formerly made by Wm. Wilcox Mfg. Company, but put on the market now by Mr. Slaymaker. Rack tumbler locks are another addition to the line made on the Slaight patents, which have recently been acquired. These are high grade goods and cost more than many other kinds. It is found, however, that the trade appreciates their quality and large quantities are being sold, especially to buyers of made to order locks who require great security, including the United States Government. In this construction a very large number of key changes, master keyed, can be made.

New Display Box for Glass Cutters.

Fletcher, Terry & Co., Forestville, Conn., makers of glass cutters, are offering the trade their Nos. A and E rose-

Glass Cutters in Display Box.

wood handled cutters in a handsome black leatherette box with gilt lettered label, as illustrated. This makes a very convenient method of packing these goods and a neat and attractive way of presenting them on shelves or counters or in showcases. By recent additions to their plant this firm is equipped for making cutters out of flat steel also, and is now prepared to fill orders in either flat or round steel, as specified.

American Door Catch No. 1.

The American Hardware Mfg. Company, Ottawa, Ill., manufacturer of the American door catch for screen doors, has added to its line the catch shown in Figs. 1 and 2, which is a larger size and slightly different in construction, for use on storm and panel doors, gates, sheds and light barn doors. The staple on the door enters the slot in the disk, and is fastened as shown, hold-

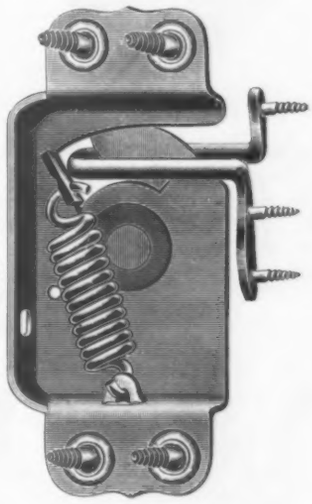


Fig. 1.—American Door Catch No. 1.

ing the door firmly against the jamb. The keeping of the door tight against the jamb is referred to as quite a feature in storm doors, preventing cold air entering and warm air getting out, also preventing the door being blown open by drafts. The point is made that no lock, knob or latch is necessary when the catch is used, and that a slight pull or gentle shove causes the catch to work automatically, whether operated from the inside or

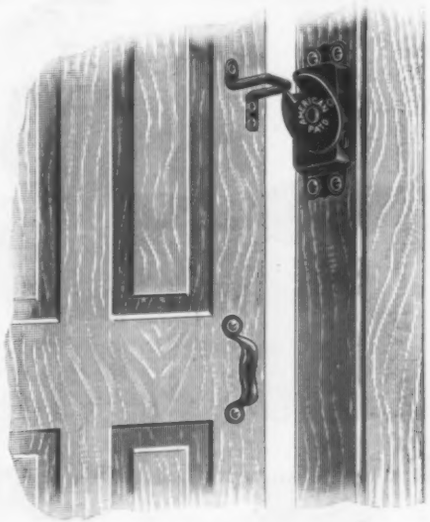


Fig. 2.—Staple About to Engage Catch.

outside of the door. It is stated that the catch will work on any door on hinges, right or left hand, up or down, in or out, flush or lapping, and that it will do the work in an effective and noiseless manner. The catch is furnished complete with staple, screws and templet, all packed in a strong envelope.

Meteor Circulating Coffee Percolator.

Manning, Bowman & Co., Meriden, Conn., and 25 West Broadway, New York, are making the Meteor circulating coffee percolators, here illustrated, which are made by them in over 100 styles and sizes. The purpose of this construction is to provide an apparatus at rea-

Fig. 1.—Meteor Circulating Coffee Pot with Glass Cover.

sonable cost capable of producing a coffee beverage without extracting the tannic acid, which, alum like, puckers and injures the membranes of the stomach and affects the nerves. In practice, finely ground coffee (not powdered) is used. The filter and glass cover are removed

Fig. 2.—Sectional View of Pot.

when the pot is filled (never less than half full) with boiling water. The filter is then replaced, after which the ground coffee is put in and the cover put on. The steam generated forces the water continuously up through the center tube, at the bottom of which is a valve, spraying it over the coffee so that it percolates through it until all the strength is extracted. The glass

Fig. 3.—Parts of Meteor Percolator.

Fig. 4.—Sectional View of Percolator.

cover enables the individual to see the whole circulating process; at the same time the aroma is kept in the infusion or essence, adding greatly to the quality of the product. The style shown has ebonized Queen handles, always cool, another style very similar having nickeled handles. Both pots are made in 2, 3 and 4 pint sizes, with nickeled bodies. Fig. 4 represents one of many similar styles having an urn formation and shows the working parts, which are separately given in Fig. 3. Immediately below the cover is a glass globe, under which is a removable strainer, the upper part of the remaining portion being a spreader cap to throw the hot liquid continually outward over the ground coffee as it unceasingly rises in the tube. At the bottom of the long tube is a valve. The removable strainer is so constructed that it can be instantly sprung into place in the glass globe by means of the spring wire edge. The Meteor percolators are constructed with body locking to stand, which can be instantly detached when desired. All the parts can easily be removed for proper cleaning. Alcohol lamps can be furnished with the urns, or the concern makes a gas burner which can be substituted for the alcohol lamp and connected by tube to gas pipe. The urn percolators have a capacity of 2½, 3½ and 4½ pints, and are finished in bright copper, nickel plate and silver plate, the inner parts being silver lined. Some of the styles are shown in an illustrated booklet for miscellaneous distribution. A point to which attention is particularly called by the makers is that by this process a saving of one-third of the coffee is accomplished.

New Dexter Brand Knives.

The several knives shown in the accompanying illustrations are manufactured by the Harrington Cutlery Company, Southbridge, Mass. The blades of the Dexter brand are manufactured by the same process that is applied to the company's knives for the leather and rubber trades, which means high grade of material as well as care in manufacture. The blades are hardened separate-

Hog Sticking Knife.

Turkey Carver.

Feather Curler.

Oyster Blade.

Dexter Brand Knives.

ly by the lead hardening process. The hog sticking knife is made in five lengths, 6, 6½, 7, 8 and 9 inches. The turkey carver, which is of the same quality as the company's butcher knives, has as a special feature an edge on the back of the point for three inches, with oval rubberoid handle and oval nickel plated ferrule. It has an 8-inch blade. The feather curler is highly polished, with dull, smooth edges, and is furnished with either burnt, cocobolo or rosewood handles. The oyster blade has a poplar handle and is manufactured in four lengths, 2, 2½, 3 and 3½ inches.

THE PHILLIP GROSS HARDWARE COMPANY, Milwaukee, Wis., has the contract for furnishing the Hardware Trimmings, Locks, Knobs, Hinges, &c., for the Milwaukee Electric Railway & Light Company's new terminal station at Milwaukee. The Hardware will be of the Chicago Hardware Company's make with the exception of the Butts and a few other minor items. The Butts will be of the Stanley ball bearing type. The contract includes 40 large Door Plates, 26 x 4½ inches, made of solid bronze.

Remington Automatic Solid Breech Hammerless Repeating Shotgun.

The Remington Arms Company, Ilion, N. Y., whose product is marketed by the M. Hartley Company, 313-315 Broadway, New York, has just put on the market the Remington automatic solid breech hammerless repeating shotgun, two styles of which are here illustrated. There

Fig. 1.—Remington Automatic Solid Breech Hammerless Repeating Shotgun, Standard Grade.

are seven styles or grades, all of which in a general way have the same structural features with variations in details of manufacture according to price. All are 12 gauge, take down, five shots, and have 28-inch Remington steel barrels, except the Riot gun, No. 0, Fig. 2, which has a 20-inch barrel. Fig. 1 illustrates Standard grade, No. 1, walnut stock, pistol grip, matted receiver, rubber butt, which weighs about 7¾ pounds. No. 2, Special, has selected walnut stock, pistol grip and checkered grip and

Fig. 2.—Riot Gun.

fore end. It is the same weight as are Nos. 3, 4, 5 and 6. No. 3, Trap, has selected English walnut stock, checkered straight grip and fore end. No. 4, Tournament, has fine English walnut stock and checkered pistol grip and fore end. No. 5, Expert, has best English walnut stock, checkered pistol grip and fore end. No. 6, Premier, is fitted with Circassian walnut stock, checkered pistol grip and fore end and is elaborately engraved, this style listing at $150. Fig. 2 represents the No. 0 Riot gun, with 20-inch Remington steel barrel, cylinder bore, walnut stock, matted receiver and pistol grip, which weighs about 7½ pounds. This firearm is especially for the service required by express messengers and guards, for bank or home protection, street disturbances, &c., and for such purposes is particularly effective when loaded with buckshot. Important features of these shotguns are the greatly reduced recoil and the rapidity with which they can be fired.

Peerless Sharpener and Steel Combined.

The Goodell Company, Antrim, N. H., and 10 Warren street, New York, has just put on the market the Peerless sharpener with steel combined, as here illustrated. Fig.

Fig. 1.—Peerless Sharpener and Steel Combined.

1 shows the tool as marketed, which is 13¼ inches long over all and has a steel for sharpening carvers, &c., 8 inches long, the surface of which has five longitudinal grooves scarcely distinguishable to the eye, made with special machinery and having exceptional sharpening power. The handle for special reasons is nickeled iron. In the end of the handle, Fig. 2, is a piece of steel 2⅜ x 9-32 x 5-32 inches cut on the two larger surfaces like a file by means of which various articles of cutlery can be sharpened, as on a grindstone, a fine edge being obtained by honing on the steel. Fig. 2 indicates the method of sharpening a carver or butcher's knife, first on one side and then on the other, explicit directions as to how to attain the best results being printed on the company's circular. Fig. 3 shows how scissors and shears are sharpened by holding the flat side of the blades to the end of the frame and drawing the blade from heel to point across the steel bar a few strokes. Meat choppers, cleavers and similar articles are also sharpened on the end, using both sides. The filelike sharpener is held by a metal wedge so that as occasion requires a new sharpening surface can be obtained by slightly moving the file steel, the capacity of which is further increased by reversing it end for end, and holding it with the small wedge. By this process the removable steel sharpening bar quickly cuts away the steel from sides of blades in much the same way as a grindstone, the long steel then being used if a finer cutting edge is desired. It will be seen that the diverging sides of the frame furnish a complete guide by means of which a knife, &c., is easily held at the same angle in relation to the sharpening surface of the bar, thus preventing rounded edges. A new sharpening bar can be inserted instantly if necessary for any reason.

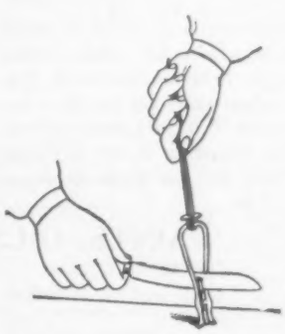


Fig. 2.—First Operation in Sharpening Carver.

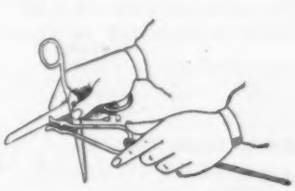
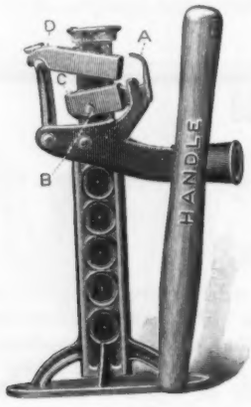


Fig. 3.—Sharpening Scissors.

E. C. ATKINS & Co., Indianapolis, Ind., have leased a building for a term of years in New Orleans, La., with a view to opening up a branch house in that city. It is their expectation to have the new branch in operation by October 1 next, stocked with a full assortment of all kinds of Mill, Crosscut, Hand, Wood and other small Saws, Saw Tools and Mill Specialties.

Quick Lift Auto Jack.

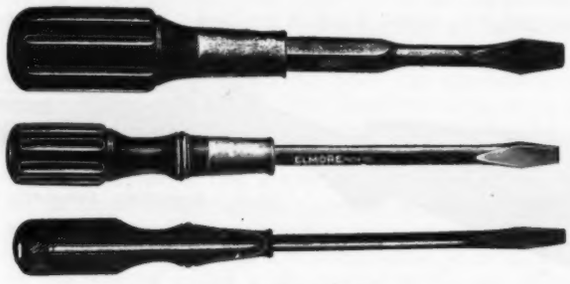
Covert's Saddlery Works, Interlaken (formerly Farmer), N. Y., is manufacturing the automobile jack illustrated herewith. It is referred to as not only a quick-lifting jack, but with its powerful leverage as requiring but little exertion to raise a touring car. It is convenient to carry in the automobile, as it occupies but one-fifth of a cubic foot of space.



Quick Lift Auto Jack.

Elmore Screw Drivers.

The Elmore Mfg. Company, Southington, Conn., represented in New York by the Smith & Hemenway Company, 296 Broadway, has put on the market a large line of Elmore screw drivers, which are illustrated in a 16-page catalogue, some of them actual size. The illustrations herewith show a regular screw driver for universal use, with a sectional view indicating the interior construction. The same principles apply to all, with variations as to shape and style, according to the purpose for which they are intended. The steel extends from point of blade through the handle and forms a top for rough work. While screw drivers are not made to be hammered on, it is nevertheless a fact that mechanics commonly use them for that purpose. Those now referred to have a steel button-like head as large as 1 inch in diameter in the heaviest sizes, diminishing in proportion as the tools decrease in size. The blades are said to be made of a special brand of steel, and every screw driver is warranted by the maker. There are specially strong steel ferrules, all metal surfaces are polished and the corrugated wood handles are black enameled. The screw driver shown in the first two engravings can be supplied in 14 sizes, 2½ to 30 inches, inclusive. The upper cut represents a machine screw driver with square shank, made in but one size, of ½-inch steel, blade 5¼ inches and length over all 10¼ inches. With this tool a wrench can be used on the square shank to loosen cap and set screws, &c. Some of the other styles made in numerous sizes are electric, cabinet, machine with round shanks, star, standard, special, pony and baby screw drivers. The company also makes screw driver bits and extension screw drivers, especially useful to piano and organ manufacturers, having with their sections an entire length of 18, 20, 22, 24 and 30 inches; also rigid screw drivers for the same class of workmen in sizes from 2½ to 24½ inches.



Elmore Screw Drivers.

Picture Knobs.

Sargent & Co., New Haven, Conn., and 149-153 Leonard, street, New York, have just put on the market a line of picture knobs, chisel pointed, to drive in plaster or wood, one of which, actual size, is here illustrated. One group of three is made of steel, as follows: J 30, ivory black finish; Y 30, bronze plated, highly polished, and A B 30, antique copper finish, highly polished. No. 35 is brass, highly polished. They are all packed and priced by the gross.

Picture Knob, Chisel Pointed.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	9¼@ 9¼
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb am'ted tins, add to keg price	@ 1½
Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	₱ lb
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	4¾@ 4¾
Zinc, French:	
Paris, Red Seal, dry	8¾
Paris, Green Seal, dry	8¾
Antwerp, Red Seal, dry	7½
Antwerp, Green Seal, dry	8¾
Zinc, V. M. French, in Poppy Oil: Green Seal:	
Lots of 1 ton and over	11¾@12¼
Lots of less than 1 ton	12 @12½
Zinc, V. M. French, in Poppy Oil: Red Seal:	
Lots of 1 ton and over	10½@11
Lots of less than 1 ton	10¾@11¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	5 @10
Black, Drop, Amer	4 @ 6
Black, Drop, Eng	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@3.60
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, American, bbls	6 @ 6½
Ocher, American	₱ ton $8.50@16.00
Orcher, American Golden	2½@ 3½
Orcher, French	1¼@ 2½
Orcher, Foreign Golden	3 @ 4
Orange Mineral, English	8 @10
Orange Mineral, French	10½@11¼
Orange Mineral, German	7¾@10
Orange Mineral, American	8 @ 8¼
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¾
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	₱ ton $15.00@30.00
Talc, American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
Terra Alba, English	₱ 100 lb 90 @1.00
Terra Alba, American, ₱ 100 lb., No. 1	.60 @70
Terra Alba, American, ₱ 100 lb., No. 2	.45 @50
Umber, T'key, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@66
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

Miscellaneous—

Barytes, White, Foreign	₱ ton $17.50@19.00
Barytes, Amer. floated	₱ ton 18.00@19.00
Barytes, Crude, No. 1	₱ ton 10.00@11.00
Chalk, in bulk	₱ ton 3.00@ 3.25
Chalk, in bbls	₱ 100 lb @ .35
China Clay, English	₱ ton 11.00@17.00
Cobalt, Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Common	₱ 100 lb .43@ .48
Whiting, Gilders	₱ 100 lb .50@ .55
Whiting, Ex. Gilders	₱ 100 lb .55@ .60

Putty, Commercial—₱ 100 lb

In Oil bbls	60 @60½
In machine bbls	60½@61

Spirits Turpentine—₱ gal.

In bladders	$1.70 @1.75
In bbls. or tubes	1.10 @1.15
In 1 lb to 5 lb cans	2.60 @2.90
In 12½ to 50 lb cans	1.40 @1.55

Glue—

	₱ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	33 @35
Bone Dried	43 @45
Button	36 @45
Diamond I	50 @52
Fine Orange	43 @45
A. C. Garnet	36 @37
D. C	65 @..
Octagon B	47 @48
T. N	41 @42
V. S. O	55 @60

Animal, Fish and Vegetable Oils—₱ gal.

Linseed, City, raw	53 @54
Linseed, City, boiled	55 @56
Linseed, State and West'n, raw	51 @52
Linseed, raw Calcutta seed	@60
Lard, Extra Prime, Winter	58 @59
Lard, Extra No. 1	47 @48
Lard, No. 1	35 @39
Cotton-seed, Crude, f.o.b. mills	@..
Cotton-seed, Summer Yellow, Prime	29 @31
Cotton-seed, Summer Yellow, off grades	@..
Sperm, Crude	55 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	60 @63
Sperm, Bleached Winter	63 @65
Tallow, Prime	51 @53
Whale, Crude	@..
Whale, Natural Winter	42 @44
Whale, Bleached Winter	44 @46
Menhaden, Brown, Strained	28 @29
Menhaden, Light, Strained	29 @30
Menhaden, Bleached, Winter	31 @32
Menhaden, Ex-Bld. Winter	32 @33
Menhaden, Southern	16½@17
Cocoanut, Ceylon	₱ lb 6¾@ 7
Cocoanut, Cochin	₱ lb 7¼@ 7½
Cod, Domestic, Prime	34 @36
Cod, Newfoundland	39 @41
Red Elaine	31 @32
Red, Saponfied	₱ lb 4 @ 4½
Olive, Italian, bbls	54 @57
Neatsfoot, prime	49 @60
Palm, Logos	₱ lb 5½@ 5¾

Mineral Oils—

Black, 29 gravity, 25@30 cold test	₱ gal. 10½@11½
Black, 29 gravity, 15 cold test	11¼@12¼
Black, Summer	10½@11½
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12½@13
Paraffine, 903 gravity	11¼@12
Paraffine, 883 gravity	9¼@ 9¼
Paraffine, Red	11½@13

In small lots ½¢ advance.

REVISED AUGUST 1, 1905

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....℔ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....℔ lb 9@9¼ ¢

Imported—

Peter Wright & Sons.....℔ lb 10¼ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur....70&10@75%
Jennings' Patn. reg. finish.50&10%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&5&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $26;
No. 2, $18.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz. $9.00@10.00
Ames .....2&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts—See *Hafts, Awl.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$6.75
Second Quality.....$6.25
Double Bit, base weights:
First Quality.....$8.75
Second Quality.....$8.25

Axle Grease—

See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait—Fishing—

Heudryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¼¢

Towel -

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned.....℔ doz. $1.50
Holt, No. B, Japanned....℔ doz. $2.00
Holt, No. 2, Tinned.....℔ doz. $2.25
Lyon, No. 2, Japanned....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@70&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.50*	*5.00*	*5.50*	*6.00*	*6.50*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells—Cow—

Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.. 60&5@60&10&5%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼ ¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting—Leather—

Extra Hvy, Short Lap.60@60&5%
Regular Short Lap...65&10@70%
Standard .....70&5@70&10%
Light Standard.....70&10@75%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft. 17½@18¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....65&70%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden....70&10@75&5%
Harts St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ x 6 and Smaller.....75&10% Larger and Longer..... 65&10&2½&10%
Phila. Eagle,$3.00 list May 2½,'99 80%
Bolt Ends, list Feb. 14, '95.... 70&2½&10%
Machine, ⅜ x 4 and smaller 75&2½&10%
Machine, larger and longer.. 70&2½&10%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.56*	*.75*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.15*	*1.40*	*2.00*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.80*	*1.25*	*1.55*

Cast Iron Shutter, Japanned, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.80*	*.90*	*1.20*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square.66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—

Plow .....65&10@65&10&10%
Stove .....82½&10@82½&10&5%

Tire—

Common 80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch			*2¼*	*2½*
Per doz.....			*$5.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball, American. $1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—

Wrought Steel...80&10@80&10&5%
Bradley's Wire Shelf.....80&10@85%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

Quart.....	*10*	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, list Sept., '96.....30%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—

Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

Ex. 10&10&5@10&10&10%

Cages, Bird—

Hendryx Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%

Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb.4¢1¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt.....4@4¼¢
Gautier, Sharp.....4½@4¾¢
Perkins', Blunt Toe.....₱ lb 3.65¢
Perkins', Sharp Toe.....₱ lb 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—
Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	128.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd.$1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....35%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$7.50	5.35	4.40	3.70	3.55	3.45	3.40
⅝	¾	⅞	1 to 1¼ inch.			
$3.35	3.30	3.25	3.25 per 100 lb.			

German Coil.....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Cow Ties.....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$23.50
6½—6-2, Str'ght, with ring..$24.50
6½—8-2, Str'ght, with ring..$28.00
6½—10-2, Str'ght, with ring.$32.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10@60&10&5%
Brass.....60&10@60&10&10%
Safety Chain.....75@75&10&5%
Gal. Pump Chain.....lb. 5@5½%
Covert Mfg. Co.:
Breast.....35&5%
Halter.....35&5%
Heel.....35&5%
Rein.....35&5%
Stallion.....35&5%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter....45@50&5%
Niagara Coil and Halter....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Niagara Wire Dog Chains..45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 35@38¢
Carpenters' Red.....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's.....45%
Eclipse.....60&10%
Russwin.....40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....75@75&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers .33 1-3@33 1-3&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged.....25&5%

Cold— *lb.*

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....50%
Universal.....50%
Combination.....50%
Drill Chucks, New Model.....30%
Drill Chucks, Standard.....45%
Drill Chuck, Skinner Pat. all sizes.35%
Drill Chucks, Positive Drive.....30%
Planer Chucks.....25%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent.....50%
Independent Steel.....40%
Union Drill.....45%
Universal.....50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....40&10@50%
Carriage Makers', Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see Vises, Saw Filers'.
Wood Workers, Hammers'.....40&10%

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7⅛ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓&33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....10.75 }
20th Century Horse, each, $5.00..20%
Lightning Belt.....$15.00 } 15%
Chicago Belt.....$20.00 }
Stewart's Patent Sheep, $12.75.....20%

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—

Hardware list: Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70&10@75%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%

Conductor Pipe,—
L. C. L. to Dealers: Galvanized.

Territory.	*Nested.*	*Not nested.*
Eastern	*70&15%*	*70&10%*
Central	*70@71½%*	*70@21½%*
Southern	*70@21½%*	*60@20%*
So. Western	*60@20%*	*60&10%*

Copper.	*1½@16 oz.*
Eastern	*50&10%*
Central	*50@71½%*
Southern	*50&5%*
So. Western	*50@21½%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....25%
Agate Lined.....25%

Coopers' Tools—
See *Tools, Coopers'.*

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com.lb. 23@24½¢
Cable Laid Italian..... lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted.17@19¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: Braided Cotton.
Old Glory, Nos. 7 to 12....₱ lb 29 ¢
Anniston, Nos. 8 to 12, 22¢; No. 7, 23½¢; No. 6, 24½¢.
Anniston Drab, Nos. 7 to 12.₱ lb 26 ¢
Anniston Mahogany.....27 ¢
Pearl Braided, cotton, No. 6, ₱ lb, 24¼¢; No. 7, 23½¢; Nos. 8 to 12, 23¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₱ lb 49 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen.....₱ lb 55 ¢
Braided, White Cotton or Spot....₱ lb 35 ¢
Massachusetts, White.....₱ lb 28 ¢
Massachusetts, Drab.....₱ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab.....40 ¢
A quality, White.....35 ¢
B quality, Drab.....35 ¢
B quality, White.....30 ¢
Italian Hemp.....40 ¢
Linen.....67½ ¢

Wire, Picture—

List Oct., '00.....85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, gr. 5½@6¢
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots, 25%
Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black.....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847.₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's.....₱ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ₱ doz. $24.00..40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....₱ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....45%
Kraut Cutters, 24 x 7, 28 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$30

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers.....₱ doz. $6.25
Iwan's Perfection Post Hole Digger..₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers.....₱ doz. $7.25
Kohler's Universal.....₱ doz. $14.00
Kohler's Little Giant.....₱ doz. $12.00
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.00
Kohler's Pioneer.....₱ doz. $7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, 7⅞ in....₱ doz. $10.00
Phillips', style 077, 7⅞ in....₱ doz. $7.50
Phillips', style x-y, 7⅞ in....₱ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., ₱.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50, 53 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 86.....75%
Victor.....55%
Defiance.....70%
Swan's:
Nos. 7565 to 7568.....50%
No. 7549.....40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
Eastern	*80&5%*
Central	*75&10&10%*
Southern	*75&12½%*
So. Western	*75&5%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. C. Iron and Steel, Standard Gauge.....60&10%
No. 26.....35%
No. 24.....25%
No. 22.....10%
Copper.....37½%
Perfect Elbows (S., S. & Co.).....40%

Emery, Turkish—

	4to½ 5 to 180	*Flour*
Kegs.....lb.	*5 ¢*	*5½¢* *3½¢*
½ Kegs.....lb.	*5½¢*	*5¾¢* *3¾¢*
¼ Kegs.....lb.	*5½¢*	*6 ¢* *4 ¢*
10-lb. cans, 10 in case...	*6½¢*	*7 ¢* *6 ¢*
10-lb. cans, less than 10.....	*10 ¢*	*10 ¢* *8 ¢*
Less quantity..	*10 ¢*	*10 ¢* *8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....40&10%

Cord and Weight—

Ives.....60%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103.....$3.75
Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.15*	*2.85*	*3.25*	*3.75*	*4.50*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....70%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures, Light.....60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} 10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.80&10@80&10&5%

Gauges—
Marking, Mortise, &c......50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@5.50
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00
Helmet Hard Oil.....25%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each.....$6.00 }
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.00

Halters and Ties—
Covert Mfg. Co.:
Web.....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....60%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
Under 3 lb., per lb. 50¢.....80&10&10@85%
3 to 5 lb., per lb. 40¢.....80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%
Cross-Cut Saw Handles—
Atkins'.....40%
Champion.....45@45&10%
Disston's.....50%
Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@$2.85
Brad Awl.....gro. $1.65@$1.85
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted.....$2.15@$2.40
Apple Socket Firmer, gro. assorted.....$1.75@$1.95
Hickory Socket Firmer, gro. assorted.....$1.45@$1.60
Hickory Socket Framing, gro. assorted.....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, Axe, &c. 60&10@60&10&10%
Hand Saw, Varnished, doz. 80¢85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	*$0.90*	*1.25*	*1.60*	*1.95*	*2.50*

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	*$1.30*	*1.85*	*2.50*	*3.00*

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.60
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.60&10&2½%
Hinged.....net $6.40
Covered.....60&10%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Cleveland.....75%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....75%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10.5&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17.....$1.25
Trolley F. D. No. 120.....$2.10
Trolley F. D. No. 121.....$2.25
Trolley F. D. No. 150.....$2.35
Safety Underwriters F. D. No. 101.....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132.....50&10%
Royal, Adjustable Track No. 122.....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24.....$1.30
Trolley B. D. No. 27.....$1.40
Trolley B. D. No. 28.....$1.60
Roller Bearings Nos. 39, 41, 43.....75%
Anti-friction No. 42.....60&20%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135.....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 400, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track...50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing..50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing...℔ doz. $5.00
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing....60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet.....50%
Wilcox Auditorium Ball B'r'g..20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door, No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%
For Track, see Rail.

Extra 5@10% often given.

Hangers— Garment—
Pullman Trouser. ℔ gro., No. 1, $9.00; No. 4, $24.00; No. 7, $7.50.
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality.40&7½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70&7½%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges.....20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 11 and 13..75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'tch	*$2.00*	*2.70*	*5.00*
Hinges only.....	*1.40*	*2.05*	*3.80*
Latches only.....	*.70*	*.70*	*.35*

New England:
With Latch.....*doz.*...@$2.00
Without Latch...*doz.*...@$1.60
Reversible Self-Closing:
With Latch.....*doz.*...@$1.75
Without Latch...*doz.*...@$1.35
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback Cast Iron.....gro. $9.00@$9.50
Non-Holdback, Cast Iron.....gro. $8.00@$8.50
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....$9.00
Chief Ball B'r'g Floor Hinge.50%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr. $9.

Extra 10% often given on these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap...75&5%
Cor. Ex. Heavy T.70&10%

Extra 10@10&5%

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3¼¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6 ¢
⅝-inch.....lb. 7 ¢
½-inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar, No. 158.....each $1.25
Steel Brick, No. 162.....each $0.95

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....35%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedging.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe,℔doz.$4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's 45%
Empire 50%
Pullman 50%

File and Tool—

Nicholson File Holders and File Handles .....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swaty 50%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt .....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&10%
Atlas, Coat and Hat.....75&10%
Bradley Metal Clasp Coat and Hat .....75&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme .....60&10%
Chief 70%
Crown 75%
Czar 65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton .....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $1.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree .....lb. 5¾@6¢
Hooks and Eyes:
Brass .....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks 35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons— Sad—

From 4 to 10.....lb. 3¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry....lb. 4¾@5 ¢
Chinese Sad.....lb. 4 @4¼¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*62*	*59*	*72*	*69*
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing..lb. 3¾@4¢

Pinking—

Pinking Irons.....doz. 50@60¢

Soldering—

Soldering Coppers, 2½ & 3..20@21¢
1½ & 2.....22@23¢

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel 45%
Covert's Saddlery Works:
Daisy .....60&10%
Victor 60%
Lockport 50%
Lane's Steel.....30&10&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's 75%
Watrous 16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz.$5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo .....℔ gro. $13.00

Miscellaneous—

Farriers' .....doz. $3.00@3.25
Wostenholm's .....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....gro.$1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather.*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading 60%
Sargent's .....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125 .....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33¼%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.70*
75 feet	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 .....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's 30%

Padlocks—

Wrought Iron....75&10&5@80&6&5%
R. & E. Mfg. Co. Wrought Steel and Brass .....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent .....50&10%
Iron 62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock 40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading 40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%

	Angular.
Jennings', Nos. 1 and 4	35&5%
Millers' Falls	5.75
Snell's, Rice's Pat. 2.50	2.75

Corking—

Reisinger Invincible Hand Power.....
℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake 20%

Ice Cutting—

Chandler's 12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	54.00
Champion Rotary Banner No. 1	54.00
Standard Champion No. 1	48.00
Standard Perfection	36.00
Cinti Square Western	30.00
Uneeda American, Round	30.00

Mallets—

Hickory .....45&5@50%
Lignumvitæ .....45&5@50%
Tinners' Hickory and Apple-wood .....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.), new list.. 50&10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....all sizes, $1.85@2.00
Cheap .....all sizes, $2.00@2.50
Better Grade..all sizes, $2.50@4.50

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental .....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania .....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Styles M., S. C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list..50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire, See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Champlain	26	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Putnam	23	21	20	19	18	...33⅓%
New Putnam	19	18	17	16	16	..10&10%

Western .....℔ lb 8½¢
Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head...	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, Blank.....$5.00
Hexagon, Blank.....$5.50
Square, Blank, C. T. & R..$5.20
Hexagon, Blank, C. T. & R. 5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.50
Hexagon, Blank.....$5.90
Square, Tapped.....$5.40
Hexagon, Tapped.....$5.80

Oakum—

Best or Government...lb. 5¾@6¢
U. S. Navy.....lb. 5¼@5½¢
Navy .....lb. 4½@4¾¢
Plumbers' Spun Oakum..2¼@2¼¢
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10@70%
Zinc .....65&10@70%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc .....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

	Per doz.
Sprague, Iron Handle	*.30@35¢*
Sprague, Wood Handle	*..35@40¢*
Sardine Scissors	*..$1.75@$3.00*
National	.....50&10%
Stowell's Sprague	℔ doz. 35@45¢
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50	

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope .....lb. 14@16¢

Rubber—

(Fair quality goods.)

Sheet, C. I.....8@10¢
Sheet, C. O. S.....9@13¢
Sheet, C. B. S.....10@14¢
Sheet, Pure Gum.....50@65¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute .....lb. 4@ 5½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

	1	*2*	*3*	*4*	*5*
Nos.					
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co. ℔ doz., Nos. 5, $1.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 230, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos: *lb.* | *Rosin Sized Sheathing:*
lb. .....6¢ | *500 sq. ft.*
Building Felt, 8, 10 and 12 | *Light weight, 25 lbs. to roll*
Mill Board, sheet, 40x40 in., 1-32 to ½ in.....10¢ | *35@40¢*
Roll Board, 1-16 in. and under .....6¢ | *Medium weight, 30 lbs. to roll, 40@43¢*
Roll Board, 3-32 and ⅛ in. 8¢ | *Heavy weight, 40 lbs. to roll.. 56@60¢*
Per roll | *Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.*
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$38.00@40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 300 sq. ft.), ton....
$32.50@35.50
2 ply, roll 168 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢

Slater's Felt (roll 500 sq. ft.) .75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h .50&10@60%

Parers— Apple—

Advance .....℔ doz. $4.00
Baldwin .....℔ doz. $4.00
Bonanza Improved.....each $6.50
Daisy .....℔ doz. $4.00
Dandy .....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
Little Star.....℔ doz. $5.00
New Lightning.....℔ doz. $7.00
Reading 72.....℔ doz. $3.25
Reading 78.....℔ doz. $6.25
Rocking Table.....℔ doz. $6.20
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00

Potato—

Saratoga .....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

List Feb 23, 1899.....75@75&5%
Cronk's Handled Garden Mattock, ℔ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in.....60%
Extra Heavy, 2-6 in.....70%
Fittings 75%

Pipe, Merchant—

Carload Lots.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
⅛ & ¼ in..	*67%*	*51%*	*65%*	*49%*
⅜ & ½ in..	*71%*	*59%*	*69%*	*57%*
¾ to 6 in..	*75%*	*65%*	*73½%*	*63½%*
7 to 12 in..	*70%*	*55%*	*68½%*	*53%*

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71%
Maryland, Delaware, E. Pa.75%
West. Pa. and West Va....71%
Virginia 76%
Ohio, Michigan and Ky....77%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....40&10%
Bench, Second qual.....50&10%
Molding .....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Unicn 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Sargent's .....60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons.....25&10@30%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $8.50

Plates—

Felloe .....lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & Co.). ℔ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers.....75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe..7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's 60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .....40&7½%
Stanley R. & L. Co.....45%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $8.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers,lb .8½@9 ¢
½-lb. papers.....lb .9 @9½¢
¼-lb. papers.....lb .9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro. $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside .....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese .....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. $11.00
2 qt., Square.....gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$6.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75
Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller.....$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ dos., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Pelican, ℔ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots.. ℔ doz. $6.00
Diamond B, No. 3, case lots.. ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15.....33⅓%
Staple Pullers.....60%
Parrot Tack and Stub Puller, ℔ doz., 75c.; ℔ gro., $6.00

Pulleys, Single Wheel—

Inch 1¼ 1¾ 2 3
Awning or Tackle, doz. .....$0.30 .45 .60 1.05
Hay Fork, Swivel or Solid Eye. doz., ½ in., $1.25; 5 in., $1.55
Inch 2 2¼ 2½
Hot House, doz....$0.65 .85 1.20
Inch 1¼ 1½ 1¾ 2
Screw, doz....$0.16 .19 .23 .30
Inch 1¾ 2 2¼ 2½
Side, doz.....$0.25 .40 .55 .65
Inch 1½ 1¾ 2 2½
Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in. .....16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal .....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list) .....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes) ..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 .....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co....40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44.....60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	*⅝*	*¾ in.*	
$2.50	*$3.00*	*$4.40*	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$2.00	*$2.70*	*$3.60*	*100 feet.*

Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾ ¢
O. N. T. Rail.....2½¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.70; 1¼ in., $4.40.
O. N. T. ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft., No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better.....℔ ft. 3¾ ¢
Standard .....℔ ft. 4 ¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common 1 x 3-6 in., $2.25; 1¼ x 3-16, $2.50; 1¼ x 3-16, $2.75.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail.....℔ ft. 1¾ ¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....℔ ft. 3¢
Wrought Bracket, 1¼ x 3-16..℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. B. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz. 12 teeth, $15.00; 14, $16.50; 16, $18.00.....80%
Queen City Lawn, ℔ doz., 29 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—

Disston's 75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Boras—I C.....60%
Fox Razors, No. 42..℔ doz. $20.00
Fox Razors, No. 44..℔ doz. $20.00
Fox Razors, No. 82, Platina.... ℔ doz. $25.00
} 40% Disc.
Red Devil.....50%
Sage & Hatch:
Arbo Anti-Rust.....℔ doz. $10.00
Herbrand .....℔ doz. $6.00
Barber .....℔ doz. $6.00
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¾, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed .....70&10%
Bronzed 75%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal. $1.85
Double Action, 44 caliber....$2.00
Automatic $3.45
Hammerless $4.00
NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in.....per doz. $2.25@$2.50
17 in.....per doz. $2.50@$2.75
18 in.....per doz. $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	*2½*	
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.40 doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in. $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... doz. 50@55¢
Hill's Ringers, Malleable Iron.. doz. 70@75¢
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper .....50&10@60%
Iron or Steel.....75@75&5%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay No. 65, $0.90; No. 50 .....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger: Pure .....lb. 11½@12¢
Sisal, 7-16 in. diam. and larger: Mixed .....lb. 8@8½¢
Pure .....lb. 9½@9¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb. 8@8½¢
Pure .....lb. 9½@9¾¢
Sisal, Tarred, Medium Lath Yarn: Mixed .....lb. 7¾¢
Pure .....lb. 9¢
Cotton Rope, on reels: Lb.
Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger. 15½@16½¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6½¢

*Thread No. 2, ¼-in. & up, lb.*5¾¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—
Galvanized ..... 42½&2½%
Plain ..... 50&2½%

Ropes, Hammocks—
Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works ..... 60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple ..... 30&10%

Rules—
Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band ..... 50&10@60%
Cross Cuts ..... 35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c. 40%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 14 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 50%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws ..... 35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws 35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 50%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws ..... 40&10@50%
Butcher Saws Blades ..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—
Atkins' Hack Saw Blades A A A ..25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35%
Diamond Hack Saw Frames 50%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..10%

Scroll—
Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scalers, Fish—
Covert's Saddlery Works ..... 60&10%

Scales—
Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. ..... *doz. $5.56*
Two Platforms, ½ oz. to 8 lbs. ..... *doz. $16.00*
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ....25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list) ..50%
Wagon or Stock (reduced list) .25@35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon.50%

Scrapers—
Box, 1 Handle ..... *doz. $2.00@2.25*
Box, 2 Handle ..... *doz. $2.60@2.85*
Ship ... Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 15%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Air Line Pattern Screens ..... 60&10%
Flyer Pattern Screens ..60&10@60&10&5%
Maine Screen Frames ..... 40&10&5%
Perfection Screens ..... 60&10@60&10&5%
Phillips' Screen Frames ...60&5@60&10%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech .doz. 30@30&5%
Hand, Wood ..... *30@30&5%*
R. Bliss Mfg. Co., Hand ....30@30&10%
Chapin-Stephens Co., Hand ..30@30&10%
Ohio Tool Co., Bench and Hand ..30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 ..... *75&17½&10%*
Coach, Gimlet Point, list Oct. 1, '99 ..... *75&12½&10%*
Hand Rail, list Jan. 1, '81 .... *20&10@75%*

Jack Screws—
Standard List ..... *75&10@80&5%*
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W 50%
Sargent ..... 70&10%
Swett Iron Works ..... 75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron .... 50@50&10%
Flat or Round Head, Brass .... 50@50&10%

Set and Cap—
Set (Iron) *80%*
Set (Steel), net advance over Iron *25%*
Sq. Hd. Cap *75%*
Hex. Hd. Cap *75%*
Rd. Hd. Cap ..... *60&10%*
Fillister Hd. Cap ..... *60&10&10%*

Wood—
List July 23, 1903.
Flat Head, Iron ..... *87½&10@..%*
Round Head, Iron ... *85 &10@..%*
Flat Head, Brass ... *85 &10@..%*
Round Head, Brass .. *80 &10@..%*
Flat Head, Bronze .. *77½&10@..%*
Round Head, Bronze .75 &10@..%
Drive Screws ..... *87½&10%*

Scroll Saws—
See *Saws, Scroll.*

Scythes—
Per doz.
Prices announced for next season:
Clipper Pattern, Grass *$6.20*
Full Polished, Clipper *$6.75*
Grain *$8.00*
Clipper, Grain *$8.25*
Weed and Bush *$6.25*

Seeders, Raisin—
Enterprise ..... 25@30%

Sets—Awl and Tool—
Aiken's Sets, Awl and Tools:
No. 20, ℔ doz., $10.00 ..... 60&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—
Octagon ..... *gro. $3.50@3.75*
Buck Bros 37½%
Cannon's Diamond Point, ℔ gro. $12.40%
Mayhew's ..... ℔ gro. $9.00
Snell's Cor'gated, Cup Pt. ... ℔ gro. $7.20
Snell's Knurled, Cup Pt. ... ℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—
Regular list ..... *75@75&10%*

Saw—
Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 ..... 50%
Nos. 3 and 4, Cross Cut, $20.00 ..50%
No. 5, Mill, $30.00 ..... 50%
Nos. 10, 11, 95, $15.60 ..... 50%
No. 1 Old Style, $10.00 ..... 50%
Special, $16.25 ..... 50%
Giant Royal Cross Cut ..... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $5.75

Shaving—
Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co. 70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carving Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50
} 40%

Skate—
Smith & Hemenway Co. 20%

Shaves, Spoke—
Iron ..... *doz. $1.10@1.25*
Wood ..... *doz. $1.75@2.25*
Bailey's (Stanley R. & L. Co.) 45%
Razor Edge (Stanley R. & L. Co.) ..35%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—
Cast Iron..	7	8	9 in.	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... *70@70&10%*
Best quality, Nickel .. *60@60&10%*
Fair quality, Jap .... *80@80&5%*
Fair quality, Nickel .. *75@75&10%*
Tailors' Shears ..... *40@40&10%*
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson's Sheep, 1900 list ..... 50&10%

Tinners' Snips—
Steel Blades ..... *20&5@20&10%*
Steel Laid Blades ..... *40&10@50%*
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in 60%
Niagara Snips 40%
P., S. & W. Forged Handles 20%

Pruning Shears—
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades ....50&10%
P., S. & W. Co. 33⅓%
Wilkinson's Hedge, 1900 list ..... 50&10%
Wilkinson's Lawn and Border 50%

Sheaves—Sliding Door—
Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—
Reading list 40%
R. & E. list 33⅓%
Sargent's list ..... 10&10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge ..... 65&10%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge .25&10%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge ..... 20&5%
Climax, Union, League, New Rival, 10 and 12 gauge ..... 25&5%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ..... 20&5%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge ..... 33⅓&5%
Robin Hood, Low Brass ..... 20&10%
Robin Hood, High Brass ..... 30&10%

Shells, Loaded—
Loaded with Black Powder ..40%
Loaded with Smokeless Powder, medium grade ..... *40&5%*
Loaded with Smokeless Powder, high grade ..... *40&10&10%*
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass ..... 50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... *per keg $4.00*
Steel ..... *per keg $3.75*
Burden's, all sizes ..... ℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag *$1.65*
Drop, B and larger ..... *per 25-lb. bag, $1.90*
Buck, 25-lb. bag *$1.90*
Chilled, 25-lb. bag *$1.90*

Shovels and Spades—
Association List, Nov. 15, 1902 ..40%

Sieves and Sifters—
Hunter's Imitation ..... *gro. $10.50@11.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*
Buffalo Metallic Blued, S. S. Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00 ..... 20%

Sieves, Seamless Metallic
—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... *doz. $0.90@0.95*
Mesh 20, Nested .... *doz. $1.00@1.05*
Mesh 24, Nested .... *doz. $1.30@1.40*

Sinks, Cast Iron—
Standard list ..... *60@60&10%*
Barnes' low list ..... 60&5%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... *80&10@80&10&10%*
Steel ..... *40@40&10%*

Slates, School—
Factory Shipments.
"D" Slates ..... *50@50&10%*
Eureka, Unexcelled Noiseless .. 60&5 tens
Victor A, Noiseless ..... *60&4 tens &5%*

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... *40@40&10%*
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade 40%
Jockey 35%
Trojan 33%
Yankee ..... 30&2%
Yankee Roller ..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Solid Swivel 60%
Sargent's Patent Guarded ....66⅔&10%

Snaths—
Scythe *50%*

Snips, Tinners—See *Shears.*

Spoons and Forks—Silver Plated—
Good Quality ..... *50&10@60&5%*
Cheap ..... *60@60&10%*
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—
German Silver ..... *60@60&5%*
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—
Teas ..... *per gro. 45@50¢*
Tables ..... *per gro. $0.50@$1.00*

Springs—Door—
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 25%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 30 in. ..... ℔ doz. $1.10
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.—

1¼ in. and Wider:	*Per lb*
Black	*4@4¼¢*
Half Bright	*4@4¼¢*
Bright	*4½@4¾¢*

Painted Seat Springs:
1½ x 2 x 26 ..... *per pr. 42¢*
1½ x 3 x 28 ..... *per pr. 70¢*

Sprinklers, Lawn—
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24 ..... 30%

Squares—
Nickel plated .. } *List Jan. 5, 1900.*
Steel and Iron . } 75&5@75&10%
Rosewood Hdl. Try Square and T-Bevels ..... *60&10&10@70%*
Iron Hdl. Try Squares and T-Bevels ..... *40&10@40&10&10%*
Disston's Try Sq. and T-Bevels 70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2 ..... 50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade ..... *doz. $1.25*
Tinned Iron ..... *doz. $0.75@1.25*
Iron, Porcelain Lined ... *doz. $1.75*

Staples—
Barbed Blind ..... *lb. 6@6½¢*
Electricians', Association list .. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized *$2.55*
Poultry Netting Staples ..... *per lb. 3¼@3¼¢*
Grand Crossing Tack Co.'s list .80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros.' 30%
C. & A. Hoffmann's 40%

Steelyards—..... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... *50@50&10%*
Curtis Rev'ble Ratchet Die Stock ..33⅓%
Derby Screw Plates 33⅓%
Green River 33⅓%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit .60%
Gem Corundum Axe, Single or Double Grit 60%
Gem Corundum Slips 60%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5¼ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. .60¢
Rosy Red Washita, 4 to 8 in. .60¢
Washita St., Extra, 4 to 8 in. .50¢
Washita St., No. 1, 4 to 8 in. .40¢
Washita St., No. 2, 4 to 8 in. .30¢
Lily White Slips ..... .90¢
Rosy Red Slips ..... .90¢
Washita Slips, Extra ..... .80¢
Washita Slips, No. 1 ..... .70¢

33⅓%

Washita Slips, No. 2.....40¢
India Oil Stones (entire list).....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
Hindostan No. 1, R'g'lar.℔ lb 8¢
Hindostan No. 1, Small..℔ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....℔ lb 80¢
Queer Creek Stones, 4 to 8 in..20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....℔ gro. $9.00
One gross or more.....℔ gro. $7.20
Lots of 10 gross or more..℔ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..℔ gro. $12.00
Lamoille S. S.....℔ gro. $11.00
White Mountain S. S.℔ gro. $9.00
Green Mountain S. S..℔ gro. $6.00
Extra Indian Pond S.S.℔ gro. $7.50
No. 1 Indian Pond S.S.℔ gro. $7.00
No. 2 Indian Pond S.S.℔ gro. $4.50
Leader Red End S. S.℔ gro. $4.50
Quick Cut Emery....℔ gro. $10.00
Pure Corundum,.....℔ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
} 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....℔ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ℔ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots..20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....50&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled $24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in, case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in, case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in, case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks..90&37½%
American Cut Tacks....90&37½%
Swedes Cut Tacks.....90&37½%
Swedes Upholsterers' Tacks... 90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90&37½%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50%
Hungarian Nails.....85%
Finishing Nails.....70%
Trunk and Clout Nails....80&5%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list .....50&10@60%
See also Nails, Wire.

Tanks, Oil— Each.

Emerald, S., S. & Co.....30-gal. $3.40
Emerald, S., S. & Co.....60-gal. $4.25
Queen City, S., S. & Co....30-gal. $3.65
Queen City, S., S. & Co....60-gal. $4.50

Tapes, Measuring—

American Asses' Skin..50@50&10%
Patent Leather.....25@30&5%
Steel .....40@40&10%
Chesterman's .....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list..... 35@35&5%
Pocket .....35@35&5%
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers.....50%
Stowell's Hay Forks.....50%
Stowell's Fork Pulleys.....50%

Miniature—

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Liftera, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern...75&10@75&10&5%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor and Oneida.....70&10@70&10&5%
O. C. Jump (Blake Pat.)..6&6@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire. doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $13.25
No. 3, Rat, ℔ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ℔ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ℔ gro. $6.00
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....℔ doz. $16.00
Grocery .....℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....℔ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....℔ doz. $18.50

Tubs, Wash—*No. 1 2 3*

Galvanized, per doz..$4.25 4.75 5.25
Galvanized Wash Tubs (S., S. & Co.):
No. 1 2 3 10 20 30
Per doz., net.$5.70 6.30 7.20 6.60 7.20 9.10

Twine, Miscellaneous—

Flax Twine: BC. B.
No. 9, ¼ and ½-lb. Balls..22@24¢
No. 12, ¼ and ½-lb. Balls..18@20¢
No. 18, ¼ and ½-lb. Balls..16@18¢
No. 24, ¼ and ½-lb. Balls..16@18¢
No. 36, ¼ and ½-lb. Balls..15@17¢
Chalk Line, Cotton ½-lb. Balls .....25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality...14½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@14½¢
American 3-Ply Hemp, 1-lb. Balls .....13@14½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....8½¢
India 3-Ply Hemp, 1-lb. Balls..8½¢
India 3-Ply Hemp, 1½-lb. Balls. 7@8¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....9@10¢
Mason Line, Linen, ½-lb. Bls..40¢
No. 26½ Mattress, ¼ and ½-lb. Balls .....37¢
Wool, 3 to 6 ply....B 5½¢; A 6¢

Vises—

Solid Box.....60&10@60&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmett Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5&70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch 50%
Solid Jaw.....50%
Merrill's 20%
Millers Falls.....60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip.....20%
Parker's:
Victor .....20@25%
Regulars .....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Sargent's 40%
Snediker's X. L. 33⅓%
Stephens' 33⅓%
Williamson Mfg Co, Double Swivel.. 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz. $30.....25%
Perfection Saw Clamps, ℔ doz....$1.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip.....15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%
Williamson Mfg. Co, Double Swivel Combination Pipe.....40&5%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25
Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:
Inch..... 6 7 8 9
Each .....45¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 1 1¼ 1¼ Inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers $5.20 4.30 3.00 2.80 2.60
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co.....40&2%
Covert's Saddlery Works.....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$25.00
Southern Territory..$19.00@20.00
Western and Central Districts .....$20.00@21.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1.65@1.70; 12-in., $2.25@2.35; 14-in., $3.40@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80&5@80&6⅞%
10 to 18.....80@80&5%
19 to 25.....80&10@80&10&5%
27 to 36.....80&5@80&10%
Galvanized:
6 to 9.....77½@77½&5%
10 to 14.....72½@72½&5%
15 to 16.....75&7½@75&10&2½%
19 to 26.....75&5@75&10%
27 to 36.....72½&5@72&7½%
Coppered:
6 to 9.....77½@77½&5%
10 to 14.....77½@77½&7½%
15 to 18.....75&10@75&10&2½%
19 to 26.....75&10&5@80%
27 to 36.....75@75&5%
Tinned:
6 to 14.....77½@77½&7½%
15 to 18.....75&5@75&10%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&10@60&10&10%
Brass, list Feb. 26, '96.....30&5%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903..90&25@90&30%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft.....3½¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....40%
Adjustable S Pipe.....40%
Bemis Pipe.....60%
Briggs Pattern.....40%
Combination Black.....40&5%
Combination Bright.....40%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5%
Coes' Genuine Steel Hdl..40&10&5%
Coes' Genuine Key Model..40&10&5%
Coes', Genuine Hammer Handle..... 40&10&5%
Coes' "Mechanics'"...40&10&10&5%
Donohue's Engineer.....40&10%
Eagle .....50&10%
Elgin Wrenches, ℔ doz.....$4.25
Elgin Rethreading Attachment, one die, ℔ doz.....$6.25
Elgin Extra Dies, ℔ doz.....$3.00
Elgin Extra Jaws, ℔ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ℔ doz.....$2.10
Gem Pocket.....30%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
Improved Pipe (W. & B.).....60%
Solid Handles, P., S. & W...50&10@60
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ℔ gross, $7.50; ℔ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ℔ doz.....$48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $7.25@7.50

CURRENT METAL PRICES.

AUGUST 2, 1905.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1 to 1¾ in. round and square	₩ lb 1.95¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.95¢
1½ to 4 in. x ¼ to 5-16	₩ lb 2.15¢
Rods—⅜ and 11-16 round and square	₩ lb 2.15¢
Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.50¢
3 in. x 5 16 in. and ⅛ in.	2.45¢
1½ to 2½ in. x ⅛ in.	2.25¢
1½ to 2¾ in. x 3-16 in. and thicker	2.20¢
1 to 1¼ in. x 3-16 in.	2.25¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ⅛ in.	2.45¢
¾ x ⅛ in.	2.55¢
⅝ x ⅛ in.	3.60¢
½ x 3-32 in.	4.10¢
Tees:	
1 in.	2.55¢
1¼ in.	2.35¢
1½ to 2½ in.	2.50¢
3 in. and larger	2.50¢
Beams	2.5 ¢
Channels, 3 in. and larger	2.5 ¢
Bands—1½ to 6 x 5-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.05¢
Burden's "H. B. & S." Iron, base price	2.85¢
"Ulster"	3.10¢
Norway Bars	3.30¢
Norway Shapes	3.80¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.95¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheet Iron from Store—

Black.

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ lb 2.60	2.70¢
Nos. 18 to 21	₩ lb 2.75	2.80¢
No. 27	₩ lb 2.90	3.20¢
No. 28	₩ lb 3.00	3.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 11½@14¢

Patent Planished ₩ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ lb, 3.05¢
Nos. 22 to 24	₩ lb, 3.45¢
No. 27	₩ lb, 3.90¢
No. 28	₩ lb, 4.15¢

No. 20 and lighter 36 inches wide, 15¢ higher.

METALS—

Tin—

Straits Pig ₩ lb 32 @32¼¢

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20	5.95
IX, 14 x 20	7.20
A. Charcoal:	
IC, 14 x 20	5.20
IX, 14 x 20	6.30

American Coke Plates—Bessemer—

IC, 14 x 20.....108 lb	$4 30
IX, 14 x 20	5.30

American Terne Plates—

IC, 20 x 28	$8.50
IX, 20 x 28	10.50

Copper—

Lake Ingot	₩ lb 15¼@16 ¢
Casting	₩ lb 15½@15¾¢
Sheet Copper Hot Rolled, 16 oz	₩ lb 19¢
" " 14 "	" " 20¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.

Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.

Bottoms, Pits and Flats ₩ lb 23¢ basis

Planished Copper, 1¢ ₩ lb more than Polished.

Seamless Brass Tubes—

Outside Diameter. Net. Base Price 20¢

Stubs' W G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	..	..	..	..	..	..	..	..	..	..	20	20
12	..	..	..	..	..	..	26	26	25	25	20	20
13	..	..	..	..	..	..	27	27	25	25	20	20
14	..	..	..	..	27	27	27	25	25	25	21	21
15	..	..	..	28	27	27	27	25	25	25	21	21
16	..	..	28	28	27	27	27	25	25	25	22	22
17	..	31	28	28	27	27	27	25	25	25	23	23
18	31	33	29	29	28	28	28	26	26	26	24	24
19	61	33	29	29	28	28	28	26	26	26	25	25
20	62	33	29	29	28	28	28	26	26	26	26	26
21	64	40	31	30	30	28	27	27	27	27	27	27
22	69	51	33	33	31	31	29	28	28	28	28	28
23	74	59	35	35	33	33	31	31	31	31	31	31
24	79	64	51	46	44	42	42	41	39	38	38	39
25	84	69	51	49	47	45	44	43	42	42	43	44

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
28	27	22	21	20	20	20	20	20	20	20	21	22	24	26	27¢ ₩ lb

Brazed Brass Tubing.

Discount from List June 6, 1898, 33⅓%.

Bronze and Copper Tubing advance on Brass List 3¢

Roll and Sheet Brass—

Discount from List June 6, 1898, 30%.

Spelter—

Western ₩ lb 6.25@6.35¢

Zinc.

No. 9, base, casks, ₩ lb 7.50¢ | Open ₩ lb 8.00¢

Lead.

American Pig ₩ lb 4.85@5¢

Bar ₩ lb 5 85@6¢

Old Lead in exchange, 4¢ ₩ lb

Solder.

½ & ½, guaranteed ₩ lb 20½@21¼¢

No. 1 ₩ lb 18½@19¼¢

Refined 17 ¢@18

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ₩ lb 14½¢

U. S. 14 ¢

Hungarian and Japanese 14 ¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots ₩ lb 37¢

1000-lb lots ₩ lb 35¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 13¾ ¢
Light and Tinned Copper	₩ lb 11¾ ¢
Heavy Brass	₩ lb 8 ¢
Light Brass	₩ lb 6¼ ¢
Lead	₩ 4 ¢
Tea Lead	₩ lb 3.75 ¢
Zinc	₩ lb 3.50 ¢
No. 1 Pewter	₩ lb 21 ¢
No. 2 Pewter	₩ lb 8 ¢
Pure Aluminum, Sheet	₩ lb 21 ¢
Tin Plate Scrap	₩ ton $....@5.00
Wrought Scrap Iron	₩ gross ton $14.50@15.00
Heavy Cast Scrap	₩ gross ton $12.50@13.50
Stove Plate Scrap	₩ gross ton $10.50@11.00

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